THE

# AMERICAN JOURNAL

# OF THE MEDICAL SCIENCES

FOR APRIL 1864.

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## *TO READERS AND CORRESPONDENTS.*

Several communications intended for this Number reached us too late for insertion, among which we may mention the paper on oblique fractures of the thigh, by Dr. David Prince; and the review of Dr. Woodward's work on the chief camp diseases of the United States armies. They shall receive early attention.

The reader will please notice that the name of Dr. Merrill is incorrectly printed on p. 414 as Morrill.

The following works have been received:—

Medico-Chirurgical Transactions. Published by the Royal Medical and Chirurgical Society of London. Second Series, Vol. XXVIII. London, 1863. (From the Society.)

The Crimean War. The British Army and Miss Nightingale. By CHARLES SHRIMPTON, M. P., late Surgeon Major French Army, &c. &c. Paris, 1864. (From Baillière Brothers.)

Phthisis and the Stethoscope: on the Physical Signs of Consumption. By RICHARD PAYNE COTTON, M. D., etc. Third edition. London: John Churchill & Sons, 1864. (From the Author.)

Substernal Aneurism: Cases and Observations on its Diagnosis, and Relation to Disease of the Heart. By A. HALLIDAY DOUGLAS, M. D., F. R. C. P. Ed. &c. Edinburgh, 1863. (From the Author.)

Metanoia: a Plea for the Insane. By HENRY M'CORMAC, M. D. &c. London, 1861. (From the Author.)

A Contribution to the Pathology of Crura Cerebri. By HERMANN WEBER, M. D., Physician to the German Hospital. London, 1863. (From the Author.)

Notes on the Climate of the Swiss Alps and on some of their Health Resorts and Spas. By HERMANN WEBER, M.D., etc. Dublin, 1864. (From the Author.)

On the Phytopathology of the Skin and Nosophytodermata: the so-called Parasitic Affections of the Skin. By ERASMUS WILSON, F.R.S. London, 1864. (From the Author.)

Dyschromatoderma; or, Discoloration of the Skin. By ERASMUS WILSON, F. R. S., 1864. (From the Author.)

The Dermal Pathology of Celsus.

A Treatise on Human Physiology: designed for the use of Students and Practitioners of Medicine. By JOHN C. DALTON, Jr., M. D., Prof. Phys. and Microscopic Anatomy in the Coll. Phys. and Surg. New York, &c. &c. Third edition, revised and enlarged, with 273 illustrations. Philadelphia: Blanchard & Lea, 1864. (From the Publishers.)

A Treatise on Pharmacy: designed as a Text-Book for the Student and as a Guide for the Physician and Pharmaceutist, containing the officinal and many unofficinal formulas, and numerous examples of extemporaneous prescriptions. By EDWARD PARRISH, Graduate in Pharmacy, Member of the Philada. Coll. Pharm., &c. &c. Third edition, thoroughly revised, and improved with important additions. With 238 illustrations. Philadelphia: Blanchard & Lea, 1864. (From the Publishers.)

An Introduction to Practical Chemistry, including Analysis. By JOHN E. BOWMAN, F. C. S., late Prof. of Pract. Chem. in King's Coll. London. Edited by CHARLES L. BLOXAM, Prof. Pract. Chem. in King's College, London. With numerous illustrations. Third American, from the fourth and revised London edition. Philadelphia: Blanchard & Lea, 1864.

The Diseases of the Ear, their Diagnosis and Treatment. A Text-Book of Aural Surgery in the form of Academical Lectures. By Dr. ANTON VON TRÖLTSCH, Aural Surgeon and Lecturer in the University, in Würzburg, Bavaria. Translated from the German and edited by D. B. ST. JOHN ROOSA, M.D., Assistant Surgeon to the New York Eye Infirmary. From the second and last German edition. New York: Wm Wood & Co., 1864.

Proceedings of the Academy of Natural Sciences of Philadelphia. October, November, and December, 1863. January and February, 1864.

Proceedings of the American Pharmaceutical Association, at its Eleventh Annual Meeting, held in Baltimore, Md., Sept. 1863; also the Constitution and Roll of Members. Philadelphia, 1863.

The Transactions of the American Medical Association. Instituted 1847. Vol. XIV. Philadelphia, 1864.

Eleventh Annual Meeting for the years 1861, 1862, and 1863 of the Illinois State Medical Society, held in Jacksonville, May 5, 1863. Chicago, 1863.

Ninth Annual Report of the Board of Trustees and Officers of the Southern Ohio Lunatic Asylum, to the Governor of the State of Ohio, for the year 1863. Columbus, 1864.

Report of the Pennsylvania Hospital for the Insane, for the year 1863. By THOS. S. KIRKBRIDE, M. D., Physician and Superintendent. Philadelphia, 1864.

Eighth Annual Report of the Board of Managers of the Children's Hospital of Philadelphia. Philadelphia, 1864.

Fourth Annual Report of the Superintendent of Clifton Hall, a private hospital for Mental Diseases, for the year 1863. Philadelphia, 1864. (From Dr. R. A. GIVEN.)

Twenty-first Annual Report of the Managers of the State Lunatic Asylum, New York, for the year 1863. Albany, 1864.

Fourteenth Annual Report of the Board of Directors and Officers of Longview Asylum, to the Governor of the State of Ohio, for the year 1863. Columbus, 1864.

Lectures on Medical Education, or on the proper method of studying Medicine. By SAMUEL CHEW, M. D., Prof. Pract. and Princ. of Med., &c., in Univ. of Maryland. Philadelphia: Lindsay & Blakiston, 1864.

Lectures on Orthopœdic Surgery. By Louis Bauer, M. D., &c. Philada.: Lindsay & Blakiston, 1864. (From the Author.)

Hospital Construction. By Francis H. Brown, M. D. Boston, 1864. (From the Author.)

The Nervous and Vascular Connection between the Mother and Fœtus in Utero. By John O'Reilly, M. D. New York, 1864.

To Know: its Source, its Mode, and its Power. An Introductory Address, delivered at the St. Louis Medical College, November 2, 1863. By Frank W. White, M. D. St. Louis, 1863.

Discussions before the Philadelphia County Medical Society, at the Conversational Meetings, from October, 1861, to March, 1862. Edited and published by Wm. B. Atkinson, M. D. Philadelphia, 1863. (From the Editor.)

The following Journals have been received in exchange:—

Medical Times and Gazette. December, 1863, January, February, 1864.

British Medical Journal. Nos. 144, 149, 150, 151, 152, 153, 154, 155, 156, 158, 159, 160, 161, 162, 163, 164, 165, 166.

Edinburgh Medical Journal. December, 1863, January, February, March, 1864.

Glasgow Medical Journal. January, 1864.

The Half Yearly Abstract of the Medical Sciences. Edited by W. H. Ranking, M. D., and C. B. Radcliffe, M. D. July—December, 1863.

The Retrospect of Medicine. Edited by W. Braithwaite, M. D., and Jas. Braithwaite, M. D. July—December, 1863.

The Dublin Quarterly Journal of Medical Science. February, 1864.

Dublin Medical Press. January, February, March, 1864.

Revue de Thérapeutique Médico-Chirurgicale. Redigé par A. Martin-Lauzer, M. D. December, 1863, January, February, 1864.

The Boston Medical and Surgical Journal. Edited by Samuel L. Abbot, M. D., and Jas. C. White, M. D. January, February, March, 1864.

American Medical Times. January, February, March, 1864.

The American Journal of Insanity. Edited by the Medical Officers of the New York State Lunatic Asylum. January, 1864.

The Cincinnati Lancet and Observer. Edited by E. B. Stevens, M. D., and J. A. Murphy, M. D. January, February, March, 1864.

Buffalo Medical and Surgical Journal. Edited by J. F. Miner, M. D. Jan., February, 1864.

Ohio Medical and Surgical Journal. Edited by the Professors of Starling Medical College. January, 1864.

The St. Louis Medical and Surgical Journal. Edited by M. L. Linton, M.D., and F. W. White, M. D. January and February, 1864.

The Chicago Medical Journal. Edited by Daniel Brainard, M. D., and J. A. Allen, M. D. December, 1863.

The Chicago Medical Journal. Edited by DeLaskie Miller, M. D., and Ephraim Ingals, M. D. February, March, 1864.

The Chicago Medical Examiner. Edited by N. S. Davis, M. D. December, 1863, January, 1864.

The Pacific Medical and Surgical Journal. Edited by V. J. Fourgeaud, M. D. November, December, 1863.

San Francisco Medical Press. Edited by L. C. Lane, A. M., M. D. January, 1864.

The Sanitary Commission Bulletin. January, February, March, 1864.

The American Journal of Science and Arts. Edited by Profs. B. Silliman, B. Silliman, Jr., and J. D. Dana. January, March, 1864.

The American Journal of Pharmacy. Published by authority of the Philadelphia College of Pharmacy. Edited by Wm. Procter, Jr., Prof. Pharmacy. January, March, 1864.

American Druggists' Circular and Chemical Gazette. January, March, 1864.

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☞ The advertisement-sheet belongs to the business department of the Journal and all communications for it should be made to the publishers.

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2. Relation Medico-Chirurgicale de la Campagne d'Orient, &c. Par G. Scrive, D. M. Paris, 1857.
3. Maladies de l'Armée (Campagne de 1854–55–56.) Par Louis Cazalas, D. M. Paris, 1860.
4. Société Impériale de Médecine de Constantinople—Discussion sur la Typhus observé dans les Armées pendant la Guerre d'Orient, Constantinople, 1856.
5. Du Typhus de l'Armée d'Orient. Par Felix Jacquot, D. M. Paris, 1858.
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2. Notes of Researches on the Intimate Structure of the Brain. Third Series. By J. Lockhart Clarke, F. R. S. From the Proceedings of the Royal Society. Vol. XII., No. 57. 8vo. pp. 7.
3. A case of rapid "Wasting Palsy" from Structural Disease of the Spinal Cord. By J. L. W. Thudichum, M. D. The Investigation of the Nervous Centres with Comments. By J. Lockhart Clarke, F. R. S. From Dr. Beale's Archives of Medicine. No. XIII., 1863. 8vo. pp. 22. With 5 plates. . . . . 463

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XVII. Transactions of American State Medical Societies.

1. Transactions of the Eleventh Annual Meeting, for the years 1861, '62, and '63, of the Illinois State Medical Society, held in Jacksonville, May 5, 1863. 8vo. pp. 80. Chicago, 1863.
2. Transactions of the Eighteenth Annual Meeting of the Ohio State Medical Society, held at Ohio White Sulphur Springs, June 16, 17, 18, 1863. 8vo. pp. 94. Cincinnati, 1863. . . . . 467

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4. Of the Vermont Asylum for the Insane, for the fiscal year 1862–63.
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XIX. Medico-Chirurgical Transactions. Published by the Medical and Chirurgical Society of London. (Second Series, Volume the twenty-eighth.) London, 1863. 8vo. pp. 225. . . . . 483

XX. Guy's Hospital Reports. Edited by Samuel Wilks, M.D., and Alfred Poland. Third Series, Vol. IX. London: John Churchill & Sons, 1863. 8vo. pp. 343. . . . . 489

XXI. The Surgical Diseases of Children: being the Lettsomian Lectures delivered before the Medical Society of London, March, 1863. By Thos. Bryant, F.R.C.S., Assistant Surgeon to Guy's Hospital, etc. etc. 12mo. pp. 148. London, 1863. . . . . 493

XXII. Lectures on Medical Education, or on the Proper Method of Studying Medicine. By Samuel Chew, M. D., Professor of the Practice and Principles of Medicine, etc., in the University of Maryland. 12mo. pp. 152. Philadelphia: Lindsay & Blakiston, 1864. . . . . 498

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XXIV. An Introduction to Practical Chemistry, including Analysis. By John E. Bowman, late Professor of Practical Chemistry in King's College, London. Edited by Charles L. Bloxam. Third American from the fourth English edition. 12mo. pp. 333. Blanchard & Lea, 1864. . . 502

XXV. On Human Entozoa: Comprising the Description of the Different Species of Worms found in the Intestines and other Parts of the Human Body, and the Pathology and Treatment of the various Affections produced by their Presence. By Wm. Abbotts Smith, M. D. 8vo. pp. 251. London, 1863. . . . . 503

XXVI. British Pharmacopœia, published under the direction of the General Council of Medical Education and Registration of the United Kingdom pursuant to the Medical Act, 1858. London: Printed for the General Medical Council, 1864. 8vo. pp. 444. . . . . 503

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ART. I.—*Of Heart-clot as a Cause of Death in Diphtheria.* By J. FORSYTH MEIGS, M.D., Fellow of the College of Physicians of Philadelphia, one of the Physicians to the Pennsylvania Hospital.

IT is now somewhat less than four years since my attention was directed to the formation of coagula in the cavities of the heart, as a cause of death in certain cases of diphtheria.

The *first case* in which I observed this accident, or result, occurred in my own practice, in November, 1860, in a little girl, between six and seven years old, healthy in every respect, and born of vigorous parents. She was one of four children, all living at the time, and this case was the only one which then occurred in the family. The attack was severe, the deposit covering the whole of both tonsils, the uvula, and a considerable portion of the posterior surface of the pharynx. The external lymphatic ganglions were very considerably implicated, the swelling and soreness being marked, but there was no œdema under the chin. The constitutional symptoms were severe, but not malignant, the appetite, in particular, being almost null. The treatment consisted of stimulants and nutrients internally, and of cayenne pepper infusion applied to the fauces, and a stimulant embrocation used externally. At the end of the second week, the disease had seemingly yielded, and, on the nineteenth day, the local symptoms had disappeared. The strength was so much improved that the child sat up in bed from time to time stringing beads, and, in the morning of the day named, she was placed in a large arm-chair for an hour. This was the first occasion on which she had been allowed to leave the bed after the onset.

On the afternoon of that day (the nineteenth) the patient was not so well. She was paler than she had been for some days, seemed weaker and

more listless, and was more restless the night following than for some nights before. On the following day, there was again the same listless appearance about the child—a weariness, inattention, paleness of the face, a weakly pulse, poor appetite, but nothing more express. Towards evening, I was still more struck with this appearance of general and inexplicable debility. And yet the muscular power was not seemingly much reduced, for, though there was no desire to sit up, the child moved freely in bed, turned, rose up and lay down without any difficulty whatever. The pulse, though feeble, was regular, between 90 and 100; the respiration easy, and no abnormal sounds to be heard either in the lungs or heart.

On the following day (the twenty-first), in the morning, I was, for the first time, seriously alarmed. The general expression was most curiously that of intense weariness, of extreme lassitude, without the slightest appearance of pain or distress anywhere. The circulation, however, was evidently failing. The pulse was still not over 100, its rhythm was correct, but the force of the arterial pulsations had lessened and become somewhat irregular, so that they were smaller and feebler than natural, and some much feebler than others. The temperature of the body was normal. The colour of the surface was paler and whiter than usual, but there was no cyanotic tint of any part. The muscular movements, as performed in bed, were natural, quick, and sometimes petulant. The patient could lie in any position, used but one pillow, had no disposition to be raised up, and gave no sign whatever of even a tendency to dyspnœa. The mind and senses were as bright as ever, and the temper, beyond occasional slight fretfulness, was good. There was no appetite, but she took milk punch and stimulants when desired.

I now examined the lungs most carefully. There was nothing abnormal about them. Then turning to the heart, which I now felt must be the seat of trouble, I sought for endocarditis or pericarditis, but, in the absence of distinct murmur or friction, of increase in the area of dulness, or of altered position of the apex-beat, and, determined too by the entire absence of fever or pain, I was satisfied that there was no acute inflammatory condition to explain the state of the circulation. What remained? The formation by slow, but continuous, concretions, within the cavities of the organ, of a mechanical impediment in the systemic circulation, the external signs of which were to be seen in the gradual, but relentless, failure of the child's vitality, and especially in the weakening pulse, and the pale surface, whilst there was not a sign of cerebral, pulmonic or digestive disorder of a serious kind. Though I have said there was no murmur nor friction in the heart-sounds, there was a curious deviation from the natural condition, which it is difficult to describe. The sounds were confused, indistinct, and seemed as though reduplicated.

From this time the patient grew gradually worse. Stimulants with

bark were freely administered, but to no purpose. The pulse became smaller and more feeble, and irregular in force, though not in rhythm, until finally it was a mere thread. The general pallor became deeper, but without cyanotic hue. The face was somewhat flushed, but, in other respects, natural. There was no trace of dyspnœa, no pain, no clouding of the mind, no cough, no febrile heat, and, a few moments before the child died, she spoke out in clear, distinct tones, and turned without any difficulty in bed, suddenly, and with force. The death was sudden, as in other cardiac diseases, about eight o'clock in the evening of the twenty-first day.

I regret that no examination of the urine was made either before or after death. At that time my attention had not been drawn so decidedly as now to the condition of the renal secretion.

*Autopsy.*—The lungs and digestive organs presented nothing abnormal. The pericardium was quite natural. The heart appeared somewhat larger than usual, owing to the fact that the right auricle was distended with a dark, jelly-like mass of coagulated blood. A large coagulum was found also in the right ventricle; this was firm, yellowish-white in colour, adherent to the interior structures of the cavity, and, from its appearance, had evidently been some time in forming. A smaller coagulum was found in the left ventricle.

Of the *second case* I have but few notes, and therefore its history will be brief and imperfect. The subject was a girl between 7 and 8 years old, of good health. She was one of quite a large family, in which the disease was epidemic, the fatal case having been preceded by a very severe one, which, however, ended favourably, in a younger child, and being followed by another fatal case from croup, and by a less severe one in an older child.

This case began January 2d, 1862. It was severe from the onset, the throat affection being marked by extensive exudation, and by great tumefaction both interiorly and exteriorly. The case continued to present the usual symptoms up to the third week, when the local symptoms gave way, and I supposed that the attack was about to terminate favourably; but the child, instead of improving decisively, continued weak and languid. The circulation became feeble, as marked by general pallor of the skin, a small but not very frequent pulse, growing day by day more and more feeble, and a slowly increasing general debility, without any disturbance of the cerebral or general nervous system, or of the respiratory or digestive functions. In this case, also, by the method of exclusion, I formed the opinion that the cause of the gradually increasing vital exhaustion lay in the circulation, and that it must be the result of coagulation of blood in the cavities of the heart. The child died on the 25th day from the onset, without any respiratory struggle, without pain, without marked or painful phenomena of any kind, with simply the signs of a slow, but constantly progressive impediment to the circulation.

The treatment consisted, as in the other case, of rest in bed from the first; capsicum gargle internally, and a stimulating embrocation to the outside of the throat; small doses ($\frac{1}{12}$ gr.) of Kermes mineral with Dover's powder on the first few days, and afterwards doses of iron, and milk punch or wine whey, with animal broth from the onset.

I was assisted at the *autopsy* by Dr. Packard, of this city. The lungs were healthy in all respects, as were also the digestive organs. The pericardium showed nothing abnormal. On opening the heart we found coagula in the cavities of both sides. These coagula were large, firm, of a dark tint generally, but dotted through with yellowish-white points. They were so firm as to force the conviction that they had been formed for a number of days. In the left ventricle, the coagulum, which filled the cavity of the organ very completely, presented some singular characters. Its lower extremity, that which corresponded to the apex of the ventricle, exhibited a broken, irregular, uneven, and frayed or granulated appearance, so as to suggest at once to our minds the idea of its having been whipped and crumbled away in minute granular portions under the crushing influence of the ventricular contractions. We could not but ask ourselves whether this was not a case of heart-clot in which there was an evident attempt of nature at cure; the mode of cure being a process of slow disintegration of the coagulum from causes acting within the clot, whilst the minute, granular, almost molecular portions thus loosened, were detached by the churning action of the ventricle, and conveyed away to distant portions of the system, there to be arrested, and then finally absorbed under the marvellous selective power of the absorbent system of the body.

This was the only case of the three that I relate, in which conditions of the clot were present, exhibiting the method by which nature strives to remove from the heart the dangerous mechanical impediment to the circulation.

The *third case* occurred in F. L., a girl, aged seven years, of healthy constitution, of unusual intelligence, and most active in all her habits. She was seized with what, for a few days, left me in doubt whether the attack was to be one of true diphtheria, or merely ordinary tonsillitis with a slight accidental exudation of false membrane in small dotted points. The general symptoms were very mild at first. In the second week the increase in the amount of the exudation, the considerable tumefaction and soreness of the cervical lymphatic ganglions, the loss of appetite, the continued febrile movement, and the decided, though moderate general weakness, showed very plainly that the case was one of diphtheria. The appetite now flagged very much, deglutition became painful, and the temper grew irritable and peevish, so that it was very difficult to nourish the patient sufficiently. At the end of the third week the throat was better; the exudation, which had never extended beyond the two tonsils and the velum, was diminishing in extent, and the external swelling had almost disappeared. The pulse was

between 90 and 100; the skin only at times rather warmer than usual, the muscular strength not greatly reduced, since the child could move freely in her bed, rise up and lie down, and sit up for some length of time to play with her toys. The appetite was poor, but by urgent persuasion the child was made to take a sufficient amount of food daily, in the form of milk punch, wine whey, animal broth, milk toast, tender meat, or some such articles of diet.

At the risk of being tedious, I must state that, though at this time the local symptoms were favourable, and the general condition, as shown by the pulse, respiration, digestion, and the state of the circulation, not positively discouraging, I felt uneasy and anxious about the prospects of my patient. The child made no decided progress towards full recovery. She was listless; the pulse was rather feeble; the surface pallid, and she had a peculiar weary expression of countenance, so that, warned by past experience, I began to fear the existence of, or a tendency to, the same accident I had already witnessed twice before, the formation of cardiac coagulum.

The urine, in its general appearances, had been natural, and was so even now, except that the whole amount was rather less than usual. Upon exposing it to heat, a very moderate amount of albumen in a granular form appeared, and thickened the fluid.

About this time (21st day), the mother left the child's room for a few hours to get some exercise in the open air, and on returning was shocked and distressed at the extremely pale, white, and weary look of the child. So strong was the impression that she declared nothing should induce her to leave the house again until the degree of danger was definitely determined. From this time the patient was not so well. The symptoms were peculiar, and unlike, in many respects, those of any morbid condition that I am in the habit of meeting with. The intelligence and all the senses were perfect in their integrity. The mind was as bright as in the best health, and, except that the temper was rather quick and irritable, and somewhat odd, the emotional nature was healthy. The muscular strength gave way very slowly. The patient could, at all times, move the head and arms freely, and up to three days before death could still rise up in bed. In the last few days she complained of weakness in, and difficulty of moving the legs—evidently a state of partial, and only partial paralysis. There was nothing like paralysis of the pharynx, and the voice, after being somewhat husky, had become clear again. The lymphatic swelling had mostly disappeared, and the fauces had almost regained their natural condition. The respiration was perfectly easy, not hurried, and there was no cough, except occasionally a loose laryngeal cough, which had replaced the previous stage of husky voice.

There was no serious dyspnœa, as the child could lie with the head and shoulders low, but the respiration was sometimes suspirious. This latter condition increased during the last two days, and especially during the last twenty hours, so that long-drawn and plaintive sighs were more and more

frequently heard, something like those which occur in the early stage of tubercular meningitis, and which told the practised ear that one of the great centres of vitality was seriously deranged. The circulation failed gradually. Each day there was a slight falling off in the power of this great system. The surface grew paler and somewhat ashy, but *not* cyanotic; it had a shrunken look. The face looked thin and anxious, or, rather, weary. The expression was peculiar. It was not what we expect to see in death from embarrassed circulation. There was no lividity, no frightened and staring eye, no pleading look, as in cardiac asthma or orthopnœa, but simply an air of intense weariness and fatigue, like that of one utterly fagged out with a long and hopeless contest with a deadly enemy. This, as well as I can describe it, was the character of the facies in this case, and in the other two which I have watched. In the absence of more specific and positive symptoms of this condition, I take the above mentioned peculiarities of the physiognomonical expression to be of considerable importance.

The pulse was feeble and small during the last week of life, these conditions becoming more and more marked as time went on. It was not frequent, running usually from 80 to 100. It was irregular in force, towards the last intermittent, but not very irregular in rhythm. During the last day it was very small, weak, thready, and with considerable intermissions. There was nothing particularly to be noticed about the heart-sounds—indeed, the child was so fretful, when disturbed, that no proper examination was made in the latter part of the attack.

The urine continued moderate in quantity, rather dark in colour, without deposit, and with a notable, but not large precipitate of albumen on boiling.

During the last week, I had stated my fear that the cause of the constant declension in the patient's state was the gradual formation of a coagulum in the heart, this being slowly added to and increased in size by daily concretions forming upon its exterior surface. I was assisted during the last week by one of our best practitioners, and during the last two days by a third gentleman, to both of whom I expressed freely my opinion. They regarded the case as a singular one, but were not as well satisfied as myself in regard to the immediate cause of the constantly failing circulation.

As death approached, late in the evening of the 28th day, the general debility became more and more marked, so that the child would ask to be assisted in changing her position. The mind and senses continued quite clear; the respiration, saving its sighing character and occasional suspensions, was not visibly difficult nor laboured; the swallowing was not materially affected except from weakness; the pulse became a mere thread, and, for half an hour before death, could scarcely be felt; the extremities became cool and then cold; the child was drowsy and inattentive; there came a longer suspension of the breathing, a slight general convulsion, repeated two or three times within a space of fifteen minutes, and the young life had gone out, under some strange cause of embarrassed circulation, which, for a

whole week, had been as tenaciously and as gradually blocking the general circulation as the slow and yet continuous formation of false membrane in the larynx, in true croup, blocks and finally arrests the function of respiration.

The treatment of this case was as follows. The child was confined to a bed or sofa from the start, being allowed to sit up to use her toys, but not permitted to run about the room. For the first few days chlorate of potash, in doses of five grains every two hours, was administered. After this, one grain of sulphate of quinia in solution with five drops of the tincture of the chloride of iron, were given every three hours, until a few days before death, when the child would no longer take it. She was then ordered a teaspoonful of elixir of cinchona, every two or three hours. When the urine was found to be scanty and albuminous, a mixture of acetate of potash, spirits of juniper, and spirits of nitre was given alternately with the iron and quinia. This soon sickened the stomach, when the spirits of nitre was given alone in water.

Throughout the case the diet was nutritious, consisting of milk-food, with bread and animal broths, and tender meat, when the child would take it. Early in the case brandy was added to the milk, and, as it progressed, the quantity was increased, or it was changed to wine whey, as it was found possible to induce the patient to use them.

The local treatment consisted at first in the use of capsicum infusion as a wash internally, with an embrocation of tincture of cantharides and spirits of turpentine applied externally from time to time. Later in the disease alum in powder, mixed with sugar, was applied to the fauces.

*Autopsy.*—Lungs natural, except that they were paler and more crepitant than usual; they exhibited no signs of collapse, and only very slight appearances of congestion at the bases behind.

Pericardium natural; no effusion beyond a few drachms, and no trace of unusual vascularity, or of exudation. The whole size of the heart rather greater than usual, and the right auricle very much larger than the left (four or five times); blackish in colour, and much distended. On opening the cavities, no trace of inflammatory action. The right side of the heart presented a firm, dark-coloured coagulum, filling up the right auricle, and exhibiting prolongations into both cavæ. These prolongations were dark coloured in their general aspect, but here and there showed oblong points of a yellowish-white colour. They were firm enough to retain their shape on handling, and to bear some traction before they broke. The coagulum in the auricle was continued through the tricuspid orifice into the right ventricle, filling up to all appearances, almost completely, the orifice. In the ventricle it occupied a large part of the cavity of that chamber, was adherent closely to the curtains of the tricuspid valve, to the chordæ tendineæ, and to the columnæ carneæ. It was here much lighter in colour than in the auricle, being whitish or yellowish-white in its tint, and having

also a much firmer and more solid consistence. In addition to the large coagulum occupying the cavity of the ventricle, there were thin layers of fibrinoid looking concretions lying in amongst the columnæ carneæ, and resting directly upon the lining membrane of the ventricle. These were adherent with a very considerable force, but could be stripped off. They reminded me, except that they were dark in colour from the colouring matter of the blood, of the exudation I have so often peeled off from the laryngeal mucous membrane. A large, firm, and dark-coloured cylindrical coagulum extended into the pulmonary artery, and was traced beyond the point where the vessel bifurcates.

The left auricle was small, contracted, and contained only a very small, dark-coloured clot. The left ventricle was of natural size, and contained a rather firm, slightly adherent, dark-coloured coagulum, which sent a small prolongation into the aorta.

*Remarks.*—I am well aware that the three cases given above are but imperfectly reported. Any one, however, who has been immersed, body and soul, for a series of years in a large private practice in an American city, will know how to make allowance for such imperfection. Even with these imperfections, I believe them to be important and worthy of publication, since they call the attention of the profession to a mode, if not a direct cause, of death in diphtheria, which thus far has not been, I believe, recognized and described. Certainly the above three cases, occurring in my own practice within a period of four years, show that this accident or condition cannot be very rare. During this period, though I have attended a great many other cases of the disease, most of them of a mild type, I have had only three other fatal cases, and all of these died from the extension of the exudation into the larynx. In neither did I suppose that heart-clot had formed, and in neither was an autopsy made. I have seen, besides these three cases in my own practice, four fatal cases in consultation, all of which died early in the disease with acute malignant symptoms.

A peculiar interest attends such cases as those above described. The patient may or may not have presented alarming symptoms at first, but these have in a great measure disappeared, and the anxiety of the family and physician, as the local and general symptoms subside, may, and indeed must, have greatly lessened, when, suddenly, or very gradually, the case assumes a new aspect. Without any very severe or threatening symptoms, the experienced physician *feels* that some new danger approaches. The sudden arrest in the progress towards health; the continuance of certain general symptoms, such as weakness and altered temper, in spite of the improvement in the local signs; the pale face and weak pulse, and the air of general and inexplicable lassitude, beget a vague anxiety which hardly takes shape in time to save the physician the mortification and distress, and the family the anguish, of a sudden and unexpected catastrophe. I have seen, both in our own and in foreign journals, accounts of cases in

which sudden and unexpected death has taken place during an apparent convalescence, in which the death has been supposed to be the result of exhaustion or syncope, or in which no attempt has been made to explain the cause of the sudden fatality. From the character of the symptoms detailed in some of these instances, I have no doubt that they were examples of the kind I have described above.

As to the cause of the coagulations I have described I have only a few remarks to make. In 1849, my father, Dr. Charles D. Meigs, called attention to the accidental formation of heart-clots in parturient women, as a result of syncopal conditions, occurring in subjects who had already lost blood by hemorrhage during or after labour. He supposes that loss of blood increases the coagulability of what remains in the system, and that the syncopal state, occurring in women who have undergone hemorrhages, invites or conduces coagulation in the heart, through the slow and partially suspended movements of the heart during the existence of the fainting condition. He reports one case (*Obstetrics: the Science and the Art*, 4th ed., Philada., p. 339) in which a heart-clot seems to have formed on the day after the labour, and in which the patient lived to the eighteenth or nineteenth day. At the autopsy "a white, fibrinous coagulum was found in the right auricle, nearly filling it, and projecting through the tricuspid valve into the right ventricle; the tail of the clot was whipped into cords by the threshing action of the chordæ tendineæ of the ventricle. The pleura of the right cavity contained a large quantity of serum." If, however, the syncopal condition is, in truth, in this class of cases, and in others that I have met with, the real exciting cause of coagulation in the cardiac cavities, as I fully believe, this explanation will not apply to the production of coagula in diphtheria.

I shall merely suggest a mode of explanation which has occurred to me. This is that some peculiar change takes place in the constitution of the fluids or tissues, more or less akin to that which gives rise to the exudation of the diphtheritic deposit on the mucous surfaces, which does, in certain instances, by an analogous power or action, induce the formation of coagula upon the interior structures of the cardiac cavities. In the *London Lancet* (vol. ii., 1863, Nos. VI. and VII.) are two Croonian Lectures, on the Coagulation of the Blood, by Mr. Lister, in which the writer supposes he has shown that the tissues, when deprived of their vital properties, comport themselves like ordinary solids, and are capable, by a kind of catalytic action, of inducing coagulation of the blood which comes into contact with them. He says:—

"Thus, when an artery or vein is inflamed, coagulation occurs upon its interior in spite of the current of blood, precisely as would take place if it had been artificially deprived of its vital properties."

If this theory be borne out by further observation, it would be necessary to look with great care, hereafter, to ascertain whether the cardiac coagulum

of diphtheria has been preceded, or is accompanied, by the evidence of endocarditis. In the cases reported above, I did not find any of the usual appearances of endocarditis.

Can they be prevented? Entirely ignorant as we are in regard to the particular variety of the disease, in which we should anticipate their formation, we can have no better rule of treatment than to act in such a way as to get rid of the disease as rapidly and thoroughly as possible; or, in other words, to make assiduous use in all cases, mild and severe, from the very outset of the malady, of the remedies and various hygienic measures which observation and experience have shown to be most powerful in combating this dangerous blood disease.

Does the patient ever recover after a coagulum has formed in the heart? I am disposed myself to hope that, in some rare instances, and under very favourable circumstances, nature may be able to rescue the patient from even this abyss of danger. There is no doubt that subjects recover after the formation of thrombi in the vessels, and I believe it is generally acknowledged that some instances of recovery have taken place after the discharge of emboli through the great vessels of the heart, these emboli having been either carried through the heart from some point in the venous system where they had been formed, or having been formed originally in the cavities of the heart. M. Virchow supposes that the coagula or thrombi formed in the vessels undergo a softening process from the centre outwards, which reduces them to a puriform substance, "a puriform but not a purulent substance" (*Cellular Pathology*, Am. ed., p. 34). He does not describe any such softening process in coagula located in the heart, but infers that such disintegration may take place in large fragments of thrombi lodged in arteries. Referring to thrombi carried through the right side of the heart, he says, page 241:—

> "I believe, namely, that when a considerable fragment of a thrombus becomes wedged at a certain point in an artery, it may in its turn crumble away through the onward pressure of the blood, and thus the minute particles to which this crumbling of the larger plug gives rise be conveyed into the small branches into which the vessel breaks up. Thus alone does it seem to me that the fact can be explained, that in the district supplied by an artery of considerable size a number of little deposits of the same sort are often found."

In one of the cases reported by me, the second, an effort was clearly being made by nature to break up and wash out from the left ventricle the clot which had there formed. Whether such an effort can ever be successful is the question now under consideration. It cannot be answered with certainty. To know that the effort was being made, is at least some encouragement. Any one who will read the description given above from M. Virchow, of the conditions observed by him in large fragments of thrombi carried into the larger branches of the pulmonary artery, cannot fail to see how closely they resemble those observed by myself in the case just referred to. I may mention that this case was observed before the publication of

M. Virchow's work in this country, and that I could not, therefore, have been led to look for the changes described by the expectation aroused by the perusal of M. Virchow's facts and opinions.

Whether the metastatic inflammations and suppurations which M. Virchow seems to suppose always ensue, as a consequence of the conveyance of the particles or fragments of the disintegrated thrombus or clot into the vessels beyond the point of formation of that thrombus or clot, must necessarily follow, is a question which I do not believe is yet positively determined. I think it may fairly be questioned whether the arrested fragments or molecules of the disintegrated coagulum, or thrombus, may not be absorbed, after undergoing some preparatory transformation like the fatty degeneration of inspissated pus, described by M. Virchow, without the invariable and necessary inflammatory changes supposed to constitute the basis of the metastatic conditions.

Several years ago I saw a case in consultation which, at the time, was extremely puzzling to me. It was that of a boy six years old, remarkably stout in build, hardy in constitution, and born of parents, on both sides, of the most vigorous and robust health. He had that characteristic which is so important in severe illness, toughness, tenacity of life, which makes the resurrections occasionally met with by all medical men in the course of a long experience. This boy had had a severe attack of scarlet fever, and had passed safely through the eruptive stage. During the desquamation he was attacked with albuminuria, and when I saw him, he was passing a very scanty amount of urine per day, which was highly charged with albumen, and which the microscope showed to contain blood-globules, very numerous and large fibrinous tube-casts, and much exfoliated epithelium. He had extensive anasarca, was much exhausted, and continued very ill for many weeks. He became emaciated, very pallid, and after the dropsy had disappeared, and the urine had greatly improved in quantity and quality, had the following curious train of symptoms. He was very feeble, so that he made no attempt to leave the bed, but he had no cerebral disorder, no material disturbance of the respiratory organs, and was always able to take his stimulants and nutrients, which were administered in large quantities, and which, with iron, constituted the essential treatment. His liver, however, became enormously enlarged, so that it extended down somewhat below the umbilicus, and then around to the crista of the right ilium. It was not painful to the touch, nor did he complain of any spontaneous pain in that region. At this time the heart-sounds had the same curious characters that were noted in the first case described above; they were indistinct, and gave at the same time the impression that they were reduplicated. The impulse was distinct, but feeble. The child continued for many weeks in this state, exhausted, emaciated, prostrate, and then began very slowly to mend, and finally, after having been in the very jaws of death, recovered entirely. Since meeting with the cases detailed in this paper, I

have often thought it not unlikely that the boy just alluded to may have had, and may have survived a heart-clot. His health was something quite unusual, both in fact, and by the law of descent, and I do not know that a recovery from a heart-clot, by the process above hinted at, would be more extraordinary than one from a wound, with loss of brain substance, caused by the passage of a tamping-iron through the anterior portion of the cerebrum, or that of the Count d'Aumale, described by Parè, who recovered after a spear had been driven from front to rear through the upper regions of the brain.

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ART. II.—*On Neuralgic Affections following Injuries of Nerves.* By J. MASON WARREN, M. D., Surgeon at the Massachusetts General Hospital.

INJURIES of the nerves belong more especially to military surgery, and have therefore, until very lately, been but little studied among us. The information given in the common hand-books is also quite meagre, and eminent authorities differ widely upon important points both of prognosis and treatment. I have thought it worth the while, therefore, to collect the opinions of a few leading surgeons upon this subject, and to compare their teachings with the results of my own experience in a few cases which have recently been under my care.

The immediate effects of the division or injury of a large nerve, are the loss of sensation and of motion, and a diminished power of resisting changes of temperature which would ordinarily cause no inconvenience. Severe pain is also a very common symptom, but is not always observed until after the lapse of a certain time after the receipt of the injury. The loss of sensation and of motion may be either temporary or permanent, as might naturally be expected, but the connection between the precise nature of the injury and the subsequent phenomena has not often been marked out with so much exactness as could be desired. I shall confine myself chiefly to the question of the treatment of neuralgia following injuries of the nerves, commencing by a few quotations from good authorities.

"The best means of mitigating the pain," says Mr. Guthrie (*Commentaries on Surgery*), "independently of the application of warmth, is by the application of stimulants to the whole of the extremity affected, followed by narcotics." The particular applications suggested are tincture of iodine or of cantharides, oil of turpentine, croton oil, liquor ammoniæ, veratria, &c., using them "of such strength as to cause some irritation on the skin, short, however, of producing any serious eruptions." He would follow these stimulant remedies by opium, belladonna, or hyoscyamus applied in

the form of an ointment; or by the tinctures of the same narcotics or of aconite applied on linen; he also suggests the employment of aconitia made into an ointment with lard in the proportion of one grain to a drachm.

Dr. Hennen (*Principles of Military Surgery*, Chapter XI., on Injuries of Nerves) states that "mechanical injuries of the nerves are entirely beyond the power of art to relieve effectually, but (that) they are objects of great curiosity, and illustrative of many important symptoms that occur in the course of practice." He mentions a secondary paralysis which "very frequently takes place without any immediate injury of the nerve, as in those cases when a ball has passed so close to a large one, or the plexus from which it proceeds, as to occasion an inflammation and consequent thickening of the neurilemma or investing membrane; or when, in the more distant transit of the ball, the tube formed by its passage swells to an extent sufficient to press on the nerve or plexus." In a celebrated case reported by Dr. Denmark (*Medico-Chirurgical Transactions*, vol. iv.), in which the patient was tormented by a severe neuralgia, corresponding to the parts supplied by the radial nerve below the elbow, amputation was performed with complete relief of the pain, and on dissection the cause of the trouble was discovered in a bit of lead imbedded in the radial nerve. In a comment on this case Dr. Hennen approves the course adopted, "although the nature of the lesion was suspected previous to amputation, and indeed almost demonstrated by the symptoms and site of the wound." His objections to any attempt to dissect out the nerve and remove the foreign body, are "the extent to which the thickened and diseased state of the investing membrane of the nerves may reach; the certainty of greatly lessening, and perhaps eventually destroying the motion and sensibility of the parts to which they are distributed, by cutting off the communication with the sensorium; the contracted or distorted state in which the limb generally is; and the possibility of exciting universal and highly dangerous commotion of the system." He further states that while "the total division of a partially wounded nerve is the only operation recognized by modern surgery, the experiment is both hazardous and uncertain; he therefore confines himself to venesection, with emollients to the parts."

An interesting case of traumatic neuralgia, lasting several months, finally recovering without an operation, reported by Mr. Longmore in Mr. Holmes' *System of Surgery*, closely resembles several of my own cases reported in this paper, and will be cited in connection with them to complete the history of this interesting affection.

In the chapter in *Holmes' Surgery* on the Diseases of Nerves, Dr. Brown-Séquard has given an able *résumé* of various reflex affections following injuries of the nervous trunks and large branches. For the treatment of all these affections, whether taking the form of epilepsy, tetanus, neuralgia, paralysis, &c., he dwells chiefly upon local measures, and among these he

gives the preference to the artificial section of the injured or irritated nerve between the brain or spinal cord and the part of the nerve which is altered. "When there is any chance of a persistence of the irritating cause after the time necessary for the reunion of the parts of the divided nerve," he states that "an excision of an inch or two, which will retard reunion, must be made instead of a simple division." He states also that owing to changes which may take place in the nutrition of the nerve above the part originally affected, it may sometimes be proper to divide the nerve at a point considerably higher than would otherwise be necessary, in some cases operating "even as near the nervous centre as safely possible." Besides these cases requiring division of the nerve, there are others in which "all that is necessary is to gain a few days to allow a wound to heal up." In such a case he recommends "to lay bare the nerve above the wound, and to drop sulphuric ether upon it, which operation, especially if repeated, will render the nerve for many days quite unable to transmit any irritation from the original wound." "Amputation of a limb (he says) should never be resorted to with the view of curing reflex epilepsy, tetanus, &c., unless of course this operation happens to be necessary for another purpose." As the next best local means after neurotomy for combating these affections, he advises the employment of "subcutaneous injections of narcotics, just above the wound, or on the irritated nerve, together with applications of emollient and narcotic lotions or poultices on the wound itself." The dose recommended for subcutaneous injection is half a grain ($\frac{1}{2}$) of morphia or one sixtieth ($\frac{1}{60}$) of a grain of atropia; he also makes the important observation "that in many cases of reflex (nervous) affections, the most powerful narcotics, especially opium, are borne in large doses, without any poisonous effect."

The proposal of the plan of treating nervous affections of this kind by neurotomy involves the whole question of the repair of injured and divided nerves, a subject not very fully discussed in works on surgery, and therefore not very familiar to practical surgeons. I have thought it proper therefore to collect such facts as I could upon the subject both of simple division of nerves and also of division with the excision of a longer or shorter portion of the trunk.

As regards the question of reunion of the two ends of a divided nerve, there is no doubt that such a result often occurs. A sufficient proof of this fact is seen in the restoration of nervous action in the trifacial nerve even after the removal of a portion of one of its larger branches for facial neuralgia,[1] also in the occasional reproduction of the nerves in the foot of

[1] In two cases where I have removed a portion of the inferior maxillary nerve, amounting to about half an inch, for the relief of tic douloureux, regeneration of the nerve with full restoration of its functions afterwards took place. In the first case, operated on by Dr. J. C. Warren, the disease was relieved for six months, when the pain returned in the same spot beyond the excised portions of nerve. A year

the horse when divided or partially excised to conceal or relieve certain forms of lameness. The same fact is also proved physiologically by the experiments of Cruikshank and Haighton upon the vagus of dogs, and anatomically by Meyer, Swan, Tiedemann and others, who have actually traced the new nervous filaments in the cicatricial tissue, uniting the cut ends and filling the void caused by the excision of a portion of several lines (and in one case nearly an inch) in length. Clinical observations bearing upon the same point are recorded by various authors. Mr. Syme, in his *Treatise on the Excision of Diseased Joints*[1] (Case VIII., page 88), gives a remarkable case in which the ulnar nerve was wholly divided at the elbow in the operation of excision of that joint, and in which the functions of the nerve were perfectly restored in the course of a few weeks. A subsequent dissection of the arm less than a year after the operation, revealed the fact that perfect union of the cut ends of the nerve had taken place, and that the nervous filaments could be traced from both ends into the intermediate new tissue and apparently also from one end to the other. In a similar case reported by M. Roux, a portion of the ulnar nerve was actually cut away, but in the course of a year sensation had entirely returned, and when the patient was examined fourteen years after the operation the sensation was as perfect as in the other arm.

A very interesting case of union of the median nerve, after division at the wrist-joint by a circular saw, occurred in the practice of Mr. Stanley, and is admirably reported by Mr. Paget. (*Lectures on Surgical Pathology.* Lecture XII.) In this case sensation began to return within ten days or a fortnight, and was nearly complete in the course of a month. In another similar case, also quoted by Mr. Paget, in which the injury was inflicted with a chaff-cutting machine, the subsequent history was much the same as in the boy treated by Mr. Stanley. These cases are cited by Mr. Paget in illustration of a mode of repair which he calls primary union in contradistinction from secondary union, which takes place by the formation of new connecting substance, and generally requires twelve months for even a partial restoration of the nervous function.

In view of these facts it is important to inquire into the propriety of

after the first operation I trephined the bone and excised a second portion of the nerve with permanent relief. In the second case, which is published in the *Transactions of the Boston Society for Medical Improvement*, June, 1858, the lower jaw was trephined near the angle, and half an inch of the nerve removed for a tic douloureux of eight years' duration, confining the patient for most of that time to her couch. This patient was entirely relieved for about a year, at the end of which time sensibility had become almost wholly restored to the parts beyond. The violent and persistent neuralgia has not returned, although occasional paroxysms are felt at the same spot as before.

[1] For the reference to this and the following case I am indebted to Dr. R. M. Hodges, who has also called attention to them in his valuable and interesting paper on Excision of Joints.

dividing the nerve as a remedy for traumatic neuralgia. In answer to this question, we may state that if the nerve is simply divided, sensation will probably return before the tissues implicated in the original injury have had time to recover their normal condition, and that, therefore, the operation will afford only very transient relief and may have to be repeated several times. If, on the other hand, a portion of the nerve is excised, the restoration of the nervous function will be very much longer in taking place, but there will also be great danger that the repair will be incomplete or even that it may fail altogether, and thus entail permanent loss both of sensation and of motion. The deliberate removal of a long section of the nerve with a view to the permanent abolition of its functions can be but very rarely indicated, and then only as a "dernier resort," as the possible alternative of amputation.

The rational treatment of these neuralgic affections seems to me to be based on the fact that their natural tendency is to recovery, if only we can keep the patient comfortable and thus induce him to wait for this tardy relief. This can only be effected by division of the nerve or by the use, either local or general, of narcotics. The protracted use of opium internally in sufficient quantity to relieve the pain, will almost inevitably exert a most pernicious influence on the health, while mere local applications to the skin seem to have very little effect. The great benefit which has been derived from the use of hypodermic injections of morphia for ordinary neuralgia, naturally suggested the propriety of trying them in this affection, and the success which has attended the experiment has been most gratifying.

The following cases of severe traumatic neuralgia, which have lately occurred in my practice, serve to throw light upon certain points in the pathology and treatment of this painful affection. In all these cases the injury seems to have been to the tissues surrounding a nervous trunk rather than to the nerve itself, and the immediate cause of the painful affection which followed would seem to depend upon the effusion of inflammatory products within the dense fibrous neurilemma, thus entangling the nerve in a mass of cicatricial tissue, perhaps also compressing its fibres. The highly favourable result in Case I. may be readily explained by the well-known law of development of new reparative material, by which it becomes gradually assimilated to the proper tissue of the part in which it is deposited. The dissection made in the course of the operation showed that the nerve was then firmly glued to the surrounding tissues, and its release from these connections was followed by perfect relief of the pain, which, however, returned in a diminished degree as soon as the process of cicatrization had again commenced. The pain was then controlled during six months by the daily use of hypodermic injections of morphia, and at the end of this somewhat protracted treatment the neuralgic affection was found to have disappeared and the nerve had so far recovered its normal condition as to conduct ordinary sensations in a very satisfactory manner. The second

and third cases are equally interesting as showing the powerful effect of the narcotic injection, in the one case in relieving the pain, and in the other actually curing it. The case of Mr. Longmore is also added to show the important part which time plays in the cure of all such cases.

CASE I. *Severe Neuralgic Affection following a Gunshot Injury of the Median Nerve.*—In the second battle of Bull Run, Lieut. A., of a N. H. regiment, was struck by a ball on the outside of the middle of the arm. The ball passed obliquely through, traversing the biceps muscle and coming out on the inside. For two or three days he was exposed to the weather, lying under the piazza of a house, having but little food, and with his hand constantly wet with the rain which was falling. The hand was benumbed, but he suffered somewhat with a sensation of heat in it, which was partially relieved by keeping it exposed to the wet. There was no pain in the wound itself. Shortly after he was removed to Washington, where he first experienced very severe pain in the whole hand, but more particularly in the part of it supplied by the median nerve. I saw him about a fortnight after the receipt of the injury. He was then in constant and severe pain in the hand, so much so as to require to be kept more or less under the influence of morphia, which he was taking to the amount of a grain a day. On examining the point at which the wound was received, a puckered eschar was seen with an induration extending deeply into the belly of the biceps muscle to which the skin was adherent. The situation occupied by the vessels and nerves on the inside of the biceps was also enveloped in a mass of indurated tissue. The first idea suggested by this state of things was to cut down upon the nerve, to divide it. It seemed, however, possible, by the gradual change going on in the tissues, that a healthy action might ultimately be set up, and at the same time, the indurated tissue surrounding and compressing the nerve might be absorbed, finally relieving the nerve from pressure. The question was whether the sufferings of the patient could be sufficiently mitigated by artificial means to allow of the adoption of a temporizing course. He was advised to place the limb perfectly at rest, wear it inside his clothes, next the body, and to have a sleeve made of sheet India rubber to envelop the lower part of the arm, which covering was to be removed from time to time, the arm exposed to the air and washed with soap and water; he was directed to discontinue the use of the rubber sleeve if much irritation was set up in the skin, and to envelop the arm in flannel instead, which he had at all times found necessary owing to the great reduction of temperature. He went home to New Hampshire, and followed this plan for three or four weeks. At the end of that period he came to me again with the desire of having the nerve divided, as his sufferings had become so intolerable, in spite of the use of opiates, as entirely to deprive him of rest. Before resorting to an operation on the nerve I determined to try the effect of subcutaneous injections of morphia. Half a grain of sulphate of morphia, in solution, was injected deep under the skin of the forearm twice a day. He was at once placed in a state of comparative ease, and the evening injection gave him a good night's rest, such as he had not enjoyed for many weeks. This plan was followed up for a month with equally good effects; his digestion was not in the least affected by the use of the morphia, and he gained considerably in flesh. If, however, the dose was omitted, the pain became as bad as ever. It was therefore decided to perform an operation. An incision of three inches in length was made over the inner edge of the biceps, and the integument dissected

on both sides separating the cicatrices, caused by the entrance and exit of the ball from the subjacent tissues. The indurated mass which surrounded the vessels and nerves was now cut into, and the median nerve being discovered where it entered was gradually laid bare and dissected out so that it lay perfectly loose in the wound for an inch and a half or two inches of its length. It was thought best not to divide the nerve, but to await the result of the healing of the wound. The edges of the wound were loosely approximated, and water dressings applied. For some days the pain was entirely relieved, although from the effect of the habitual use of morphia, a small dose was required to promote sleep. As the wound began to heal, however, the pain returned, but was much less severe than before. Desiring now to return home, one of his family was instructed in the use of the subcutaneous injection of morphia. About two months afterwards he called on me, and again (March 20, 1863) four months after the operation. He was then in a state of perfect health, and had gained much flesh, but complained still of neuralgic pain in the hand, requiring the employment of the narcotic injection, whether from habit or not seemed to be a question. The arm, hand, and fingers had begun to acquire some motion. In regard to the local effect of the injections it may be said, that although they had been used twice a day for five months, he had never suffered from any irritation at the point of puncture except in one instance in the case of a freshly prepared solution of sulphate of morphia, the use of which was followed by the production of a large red blotch whenever it was injected. On substituting a solution of acetate of morphia no farther trouble of this nature was experienced.[1] The patient had, therefore, had nearly three hundred injections of morphia, more or less, and with the above exception no traces remained of its protracted use.

*Oct.* 26, 1863. I have just seen this patient, and find that he has recovered his health and enjoys complete immunity from pain. The hypodermic injections were continued until the month of July, or about nine months from the receipt of the injury. He then by a great effort suddenly discontinued them, and has not used them since. The neuralgic affection, except during extreme changes of the weather, has left him. The forearm has recovered its natural sensibility; he has the power of complete flexion of the elbow, and of partial rotation of the forearm, while the fingers, which were formerly held in a state of extension, can now be approximated to the thumb, so as to make the hand useful for most of the ordinary purposes of life. This motion is continually improving.

CASE II. *Gunshot Wound of the Thigh implicating the Sciatic Nerve.*—I have lately had under my care, in the hospital, a soldier, who, two months before, was shot in the thigh, and was taken prisoner. The ball traversed the thigh from side to side, and, probably, injured the sciatic nerve, in whose immediate neighbourhood it must have passed. He suffered no inconvenience in the site of the wound, but shortly afterwards a severe neuralgic pain commenced in the sole of the foot, accompanied by a sensation of heat and great tenderness of the part, and entirely incapacitating him for locomotion. Opiates in the usual form gave him

[1] This accident is probably to be explained by the common practice of adding free sulphuric acid to promote the solubility of certain specimens of sulphate of morphia. The acetate is very soluble in water.

but little relief, and the only alleviation of his sufferings while in prison at Richmond was obtained by keeping the leg constantly plunged in a pail of cold water. I immediately ordered the subcutaneous injection of a quarter of a grain of morphia daily into the leg, and gradually increased the dose to a grain a day. By this treatment the pain was completely held in check, rendering his days and nights comfortable. The full effect of each dose was obtained in from five to ten minutes after injecting it.

In the course of this case I experimented as to the effect of the injection, when made at a distant part of the body, as compared with its effect when applied in the immediate vicinity of the affected nerve. I found that when the injection was made in the opposite limb to that affected, the relief was as prompt and as complete as when made directly over the course of the nerve; and this occurred repeatedly, in every instance in which it was tried. This is a point of very considerable importance, inasmuch as it is often very inconvenient to make the injection in the exact situation of the affected nerve, as has been strongly insisted on by several writers upon this subject.

CASE III. *Injury of the Ulnar and Musculo-Spiral Nerves, from a Bullet.*—Capt. C——, who had already been twice wounded in the thigh and leg in the battles of Winchester and Fredericksburg, was hit at the battle of Gettysburg by a ball just over the median nerve. It passed in a spiral direction around the bone, and came out half way down the limb below on the other side. The hand and forearm were at once partially paralyzed, and in a day or two very severe neuralgic pains commenced, principally in that part of the hand supplied by the ulnar nerve. When I first saw him, about a week after the injury, the arm was much swollen, and the wounds, which had still on them the cold water dressing, were in an irritable state, and there was no appearance of suppuration. The water dressings were replaced by a large warm poultice, and on a free suppuration being established the extreme pain in the arm and hand was much relieved. The pain, however, still continued to recur at intervals, and the paroxysms coming on at night were very severe. Finally the hypodermic injection of morphia was tried, and a single dose of $\frac{1}{2}$ grain afforded entire relief for the time being, and in fact destroyed the habit so that the paroxysms did not recur. The hand and arm, however, for a long time afterwards were very uncomfortable on account of the excessive heat of the parts, which was only relieved by the constant use of cold water, and it was not until after several months that the normal sensibility began to return, and this symptom to disappear. Seen again at the end of five months, he was free from neuralgic pain, had some use of his hand, and the elbow has become flexible after employing forcible extension to overcome stiffness produced partly by inaction and partly by the contraction of the injured muscles. The movement of rotation of the forearm had not not yet been recovered by the patient, although they could be easily made by a second person, the nervous power being still deficient.

Case recorded by Mr. Longmore (Holmes' *System of Surgery*, vol. ii. p. 88).

"A soldier of the 37th Regt. was wounded at Azimghur on the 27th of March, 1858, by a musket ball through the right side of the neck. It entered just below the horizontal ramus of the jaw, and made its exit behind, over the scapula. About three pints of blood escaped, supposed to be from the external jugular vein. The wound healed favourably, but he lost the use of his right arm, at first completely, and afterwards partially, for three months. At the expiration

of that period the power of the arm was restored, but he was invalided home on account of severe pain in the back of the neck, 'resembling toothache,' which all treatment failed to relieve. The pain spontaneously and gradually ceased; there is still some loss of substance of the trapezius muscle of the right side of the neck, and of the right as compared with the other arm, with occasional numbness, when the man is in heavy marching order; but in all other respects he is well, and is at his regular duty."

BOSTON, January 15, 1864.

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ART. III.—*Surgical Notes of Cases of Gunshot Injuries occurring during the Advance of the Army of the Cumberland in the Summer of* 1863. By I. MOSES, M. D., Surgeon U. S. V., Medical Director.

IN compliance with orders to report for duty to the commanding officer of the department of the Cumberland, I proceeded to Murfreesborough and was assigned to duty as medical director, April 29th, 1863. This village was formerly a pleasant place of residence, with about twenty-five hundred inhabitants, most of whom were engaged in trade. The stores are situated on the four sides of a square, with the court-house, a handsome brick structure, in the centre. The streets, not wide, lead thence in several directions, and have on either side wooden cottages and occasional brick mansions of more pretensions surrounded with gardens; the surrounding country is gently undulating with fine woods. The whole locality is limestone, cropping out near the surface into vast ledges with little or no superincumbent soil.

The water, whether of Stone River, its tributaries, or from springs, is decidedly limestone, and produces irritation of the bowels for several days in persons newly arriving; there are a few good springs of pure water, but the inhabitants prefer rain water collected in cisterns.

The majority of the inhabitants, especially males, had left the place, being actively engaged in the ranks of the Confederate army.

This being the headquarters and the front of our forces, was the centre of our line, extending from Franklin on the right to nearly McMinnville on the left. Our forces encamped around the town, the buildings were principally occupied as headquarters of generals, the staff departments, and as hospitals.

There were in all thirteen hospitals, as follows:—

Field hospital, under charge of Surgeon J. Y. Finley, 2d Kentucky Cavalry, composed of hospital tents erected two together, end to end, in streets, with wooden houses as kitchens and dining-rooms, capable of accommodating sixteen hundred sick or wounded. A garden of forty acres was being planted in the grounds on the south side of the banks of Stone River. This hospital was between the field works and the river,

under protection of the guns of the former. The site was within a bend of the river, which thus surrounded it on three sides; the drainage excellent, conveniences for bathing and supply of spring water limited, but enough, with economy, for ordinary purposes of drinking and cooking. The latrines were pits from eight to ten feet deep in the streets, covered with wooden houses, which were filled with earth and lime from time to time, and when nearly full covered up and new ones dug. With all care, however, there was more or less odour at all times, and especially in wet weather; various disinfectants were constantly used. On May 1st, there were one thousand two hundred and thirteen sick and eighty-five wounded in the hospital.

Hospital Division No. 1 consisted of a large hotel on the square, with low ceilings and much cut up into small rooms and narrow halls, illy adapted for its purposes, as was evidenced by the great mortality among the sick and wounded, and by several cases of hospital gangrene, erysipelas, and adynamic conditions among the inmates. On the 22d, I commenced to break up the hospital by reducing the numbers, sending the majority to the field hospital or to Nashville, and on the 26th, there were no sick or wounded in the building. There had been, May 1st, one hundred and one sick and thirty-eight wounded in this hospital.

Hosp. Div. No. 2 consisted of a private residence of two stories, neatly kept, and contained for the most part cases of rubeola; there were, May 1st, fifty-one cases. The disease generally was of a mild character. Five deaths occurred up to June 9th, when the cases became so rare that the hospital was broken up.

Hosp. Div. No. 3 was decidedly the best hospital, consisting of six large floors or wards thirty by one hundred and fifty feet, with large windows reaching from floor to ceiling, and central apertures in the floors. The police and discipline were admirable. In this there were eighty sick and seventy-four wounded.

Hosp. Div. No. 4. This building, containing six small wards, was originally a private hospital; the police and discipline were defective; it was reserved for cases of erysipelas exclusively. There were fifty-seven cases, seven of whom were wounded. Cases did not do well; frequent relapses occurred; the disease was severe and fatal. Ten deaths occurred up to June 9th, when the hospital was removed to the field and the patients put in tents.

Hosp. Div. No. 5 consisted of four wards tolerably well ventilated, but deficient in police and discipline. In this there were one hundred sick and thirty wounded. It was discontinued June 5th, a portion of the inmates being sent to Nashville and the remainder to the field hospital.

Hosp. Div. No. 6 consisted of four well-ventilated wards, tolerably clean, containing one hundred and fifteen sick and one wounded.

Hosp. Div. No. 7 consisted of four wards of moderate size, clean and

well ventilated, but at the corner of the public square, and being exposed to noise and dust, containing fifty sick and twenty-one wounded.

Hosp. Div. No. 8 was the smallest and least adapted for its purposes; it contained thirty-seven sick; clean and well ventilated.

The smallpox hospital was about two miles from the city near a fine spring, isolated and composed of tents. It generally contained about fifteen patients; the type of disease was mild, and there were few deaths. It contains now (July 30) eighteen cases.

The contrabrand hospital is designed for the sick blacks, and consists of a portion of a large building for females and children, and tents for males. There were usually about fifty inmates, their diseases being chiefly fevers and diarrhœa, with various forms of scrofulous affections; the mortality was large.

The Soule Seminary, a fine large building, in the centre of a large open space at the verge of the town, and particularly well adapted for a hospital, contained about sixty Confederate wounded. The cases were of the gravest character, being those who could not be removed. After the battle of Stone River, this building was crowded with wounded, who, on the retreat of Bragg, were left under the care of their own medical officers. The mortality had been frightful, and hospital gangrene, pyæmia and erysipelas very rife. Every facility was afforded for their care and comfort, but filth and dirt of every description were allowed to accumulate inside and outside, under the beds, in the fireplaces, halls and kitchens. The persons of the patients were rarely or never washed, and the surgical dressings were carelessly applied. I broke up this den a few days after my arrival, and removed the patients to the Baptist Seminary, a fine building beyond the town, standing alone, well ventilated, and admirably adapted for a hospital. It was occupied by about the same number of Confederate wounded. The same remarks may be applied to the police and condition of patients here as in the last-named hospital. Some improvement in cleanliness and comfort was made, and several cases placed in tents outside. Some of the cases presented remarkable examples of the powers of nature under most forbidding circumstances in the process of cure. There were several men who had received comminuted fractures of the thigh by minié balls, and where union had taken place, but with great shortening and deformity. One man had lost the larger portion of the shaft of the tibia and fibula, who is now recovering with regeneration of the bone, though there is not firm union.

The number of wounded confederates left at this post after the battle of Stone River was about fifteen hundred, of whom more than six hundred died. This hospital was broken up about June 1st, all but ten of the worst cases being sent north; these ten, incapable of being removed, were sent to the field hospital, and have done well, except one, who having extensive hospital gangrene, sank, though not until the process was checked and the wound assumed a healthy appearance.

The prevailing diseases were fevers of various types, intermittent, remittent, typhoid, and that mixed form termed *typho-malarial*. Diarrhœa and dysentery were very prevalent and obstinate; jaundice was very common; a few cases of scorbutus, and of pneumonia; cases of syphilis were rare. A wise exclusion of intoxicating drinks made drunkenness almost unseen.

Abuses existed in the administration of several of these hospitals, and so little economy was practised that the hospital fund was in debt nearly two thousand dollars, while the sick and wounded had few or no extra articles of diet.

Maj. Perine, Medical Director of Department, had sent on for a supply of delicacies, which arrived about the middle of May, and by judicious returns for rations, the debt is paid, and there is now a large surplus of hospital fund in the hands of the commissary, while a bountiful supply of milk, eggs, butter, cheese, chickens, canned fruits and vegetables, fish, prunes and other dried fruits has been furnished, and our sick and wounded of this army can now be furnished as well and as liberally as those in the neighbourhood of Washington, and the price of the ration, about twenty cents, seems sufficiently large to yield a considerable saving.

Early in June, in anticipation of a forward movement by Gen. Rosecrans and an abandonment of the town, I was directed to break up all the hospitals in the town and remove the patients to Nashville or to the field hospital, which was accomplished on the 10th of the month.

The Soule Seminary, previously occupied as a confederate hospital, had been cleaned, whitewashed, and thoroughly ventilated. It was now fitted up anew ready to receive patients if required.

On the 21st of May, all the sick of regiments who were unfit for active service were directed to be sent to hospital, and some two thousand were admitted and distributed. No advance taking place, all remained quiet for a month, and on the 22d and 23d of May, the regiments were again purged of the invalids and malingerers, and the army moved forward in three columns.

Severe skirmishing occurred with the rear of the enemy, who were in retreat, and on the evening of the 24th the wounded began to come in, and continued to arrive day and night on the 25th, 26th and 27th. These cases were mostly of a severe character, and had been carried in ambulances over muddy, rough roads from fifteen to thirty miles; they had received their first dressings on the field.

Rain, which had set in on the day the army advanced, continued incessantly night and day, and the men were greatly exhausted previous to the fighting by marching and exposure to the wet weather.

On arrival they were very much exhausted; many had not slept for two nights, and had had little to eat. The majority of the wounds had been dressed with cloths dipped in cold water and an excess of roller bandage; quite a number had maggots in the wounds.

There were admitted into the field hospital during the month of June, one hundred and fifteen gunshot wounds, while there were forty-six remaining from the month of May, being the remnant of the wounded of Stone River, who were still too feeble to bear transportation, though their wounds were mostly healed. A new ward, consisting of double hospital tents, pitched on new ground, was established for the reception of the wounded, and every provision made for their comfort which could be afforded in a field hospital.

*Abstract of Gunshot Wounds received during the month of June*, 1863.

| | | | Right side. | Left side. |
|---|---|---|---|---|
| GUNSHOT WOUNDS. | Flesh wounds. | Of head | 1 | 4 |
| | | neck | | 3 |
| | | trunk | 8 | 10 |
| | | upper extremities | 11 | 6 |
| | | lower " | 14 | 21 |
| | Cavities. | lungs | | 1 |
| | | abdominal cavity | | 2 |
| | Fracture of bones. | facial bones | 1 | |
| | | clavicle | | 1 |
| | | humerus | 4 | |
| | | forearm | 3 | 3 |
| | | femur, upper 3d | 1 | 3 |
| | | leg | | 1 |
| | | ribs | 1 | |
| | | other bones | 3 | 5 |
| | Involving joints. | shoulder-joint | 1 | |
| | | wrist | 3 | |
| | | hip | | 1 |
| | | knee | | 1 |
| | | ankle | 2 | |
| | | Total | 53 | 62 |

*Abstract of Gunshot Wounds received during the month of July*, 1863.

| | | | Right side. | Left side. |
|---|---|---|---|---|
| GUNSHOT WOUNDS. | Flesh wounds. | Of head | 1 | |
| | | trunk | 1 | 1 |
| | | upper extremities | 2 | 2 |
| | | lower extremities | 1 | 2 |
| | Cavities. | lungs | | 1 |
| | Fracture of bones. | cranium | 1 | |
| | Involving joints. | elbow | 1 | |
| | | Total | 7 | 6 |

Making a total of one hundred and twenty-eight (128) cases, as the result of skirmishes attending the advance, and received into this hospital.

Hospital No. 1, or the Soule College, originally a flourishing female seminary and previously occupied as a Confederate hospital, had been thoroughly cleaned, whitewashed, and all offensive matters removed from the vicinity; partitions were removed and the rooms thrown into large wards. This was prepared for the reception of wounded after having been vacant six weeks, abundant time to remove all danger from its former impurities.

The wounded, on arrival at night, were placed into clean, dry beds, after being washed and dressed in clean clothing. Their hunger and thirst satisfied with warm food, and those requiring surgical dressings were properly attended to. The majority soon sank into deep sleep.

There were received into this hospital one hundred and thirty cases of gunshot wounds received in action and in localities shown by the following table:—

| | | | Right side. | Left side. |
|---|---|---|---|---|
| GUNSHOT WOUNDS. | Flesh wounds. | Of head | 2 | |
| | | neck | 2 | 1 |
| | | trunk | 10 | 8 |
| | | external genitals | 3 | |
| | | upper extremities | 5 | 8 |
| | | lower extremities | 15 | 12 |
| | Cavities. | lungs | 4 | 2 |
| | | other wounds of abdominal cavity | 3 | 2 |
| | Fracture of bones. | cranium | 1 | |
| | | facial bones | 1 | 1 |
| | | clavicle | 1 | |
| | | scapula | | 1 |
| | | humerus | 4 | 2 |
| | | forearm | | 3 |
| | | lower third | | 2 |
| | | middle third | | 2 |
| | | upper third | 3 | 2 |
| | | leg | 3 | 3 |
| | Involving joints. | elbow | 2 | 1 |
| | | wrist | 1 | |
| | | hip | 1 | 2 |
| | | knee | 6 | 3 |
| | | ankle | 1 | 3 |
| | | other joints | 3 | 1 |
| | | Total | 71 | 59 |

The weather at this post has been generally pleasant; temperature moderate; the early half of June was warm and dry, while since the 24th, up to August, large quantities of rain had fallen, said to have been unusual in former seasons. The army commenced its advance on the 23d June, from this post, and from that day rains fell continuously, night and day, or heavy showers on June 24th, 25th, 26th, 27th, 28th, 29th, 30th, and July 3d, 4th, 5th, 7th, 9th, 10th, 11th, 12th, 13th, 19th, 20th,

21st, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 30th, being twenty-six days out of thirty-eight. During the last week in June, our army was toiling through mud, constantly exposed night and day to the rain, sleeping on the ground and being deprived of means of cooking, the temperature warm and enervating. Large numbers fell out and straggled back to the post. On arrival at the Field Hospital, the same state of universal moisture existed; bedding and clothing being in a constantly wet condition, so as to produce mould and rot, while at Hospital No. 1, they were received into dry beds and kept dry. To this cause alone may be ascribed the great difference in the record of cases. While all the wounded in the Hospital No. 1 presented a cheerful aspect, and continued to progress from day to day most favourably, without the usual unfortunate complications, the contrary prevailed at the Field Hospital; the men soon began to have a pale, anxious look; gangrene, pyæmia, erysipelas and diarrhœa set in; there was a languor in reparative processes; bones did not unite; bad sores frequently appeared, and, at the end of one month, I observed that only one wound had a perfectly healthy granulating surface, and this very case subsequently died of pyæmia.

The only assignable reason for this sad condition of things was the continued rainy weather, producing a moist atmosphere, and damp tents and bedding.

The appearance of hospital gangrene, its almost simultaneous occurrence in several cases in different tents, and those tents at the end of a row, pitched upon ground lower than the other tents of the row, seem to strengthen our views of its development from moisture.

The first case of gangrene admitted into this camp was in a Confederate soldier, who was removed from a hospital in town; the disease had ceased, and the wound was in a healthy condition, but his general health was much enfeebled, and he subsequently died of exhaustion. There is reason to believe that the disease was communicated to the first case by direct application through a sponge which was carelessly used by a nurse.

As these cases contain facts of interest, I will relate briefly their history.

CASE I. Charles Lake, private Co. C, 4th Ohio Cav. Wounded June 7th, on scout. Admitted into General Field Hospital, June 8, 1863. The ball passed through the middle and posterior third of the thigh. The wound did very well under cold water dressing until June 19th, when it presented a sluggish appearance. Labarraque's solution was applied and warm water dressing used. On the following morning it presented every appearance of being gangrenous; nitric acid was then applied and for the three following mornings without arresting it. Bromine was then resorted to, along with stimulating poultices. The gangrenous action was entirely arrested after the second application. The skin and cellular tissue were the only ones involved. The patient never presented a bad symptom, and was transferred to Nashville.

This case was in the tent with the confederate soldier, and the same sponge was used to wash his wound, which was slight, passing through the

skin and cellular tissue, and about two inches in length. As soon as the disease appeared, the patient was put in a tent by himself, a special nurse detailed, and all care taken against the spread of the disease.

The gangrenous action increased, and the tissues were involved to the extent of the size of a large hand before it could be checked. The immediate check in the disease by bromine, after repeated trials of nitric acid, was well marked.

The general health and appearance of the man were completely undisturbed. His appetite good, sleep natural, and functions well performed throughout the continuance of the disease. He took no medicine, and his food was nutritious.

CASE II. John Wiss, Corporal Co. A, 32d Indiana Inf., wounded June 24, 1863, at Liberty Gap. Admitted into General Field Hospital June 26th. The ball passed through the upper third of the forearm on the ulnar side, fracturing the ulna for about two inches of its extent. The shattered fragments were removed and cold water applied until July 5th, when gangrenous action commenced. General health up to this time was very good.

On July 5th, the patient had slight fever, no appetite, and had not rested well during the night. Warm water dressing was substituted for the cold, and Labarraque's solution freely applied for three days without any beneficial effects. On the 9th of July bromine (pure) was applied, and on the 12th healthy granulations began to show themselves. On the 16th gangrenous action was entirely arrested. The tissues involved were the skin and cellular. During the time gangrenous action was going on, the patient had stimulants, tonics, and good diet.

He is still in the hospital, and is regaining his health rapidly.

CASE III. A. J. Ryan, private Co. A, 49th Ohio. Wounded June 24th, 1863, at Liberty Gap. Admitted into General Field Hospital June 27th. The ball passed through the fleshy part of the middle third of the leg. The patient's general health was good, and simple cold water dressing was applied to the wound until July 14th, when gangrenous action commenced. The wound was thoroughly cleaned and bromine (pure) applied, warm water being used as a dressing. Healthy granulations began to show themselves on the 17th, and on the 19th gangrenous action was entirely arrested.

The patient's health was very little impaired ; tonics, stimulants, and good diet were freely given to him. He was able to bear transportation, and was removed to Nashville July 27th.

CASE IV. Wm. A. Statia, Sergeant Co. A, 7th Ill. Cav. Wounded June 24th, 1863, at Bradyville. Admitted into General Field Hospital June 27th. The ball passed through the upper third of the leg close to the inner side of the tibia. The wound did very well under cold water dressing, until July 8th, when the secretion was apparently arrested, and July 9th gangrenous action commenced. The case was treated similarly to the previous one, and gangrenous action was arrested July 12th. The periosteum of the tibia was somewhat destroyed, which no doubt will delay the healing of the wound. The patient was sent to Nashville July 27th.

CASE V. Wm. H. Beaver, Corporal Co. F, 7th Pa. Wounded June 27th, 1863, at Shelbyville. Admitted into General Field Hospital June 28th. The ball passed through the fleshy portion of the arm, close to the insertion

of the deltoid, without injuring the bone, and then passed through the muscles overlaying the ribs, close to the outer border of the scapula. The wound from the first did not do well; the secretions were unhealthy, the arm became very much inflamed and swollen. On July the 4th, the wound was laid open along its whole extent, washed with Labarraque's solution, and warm water dressing applied. This treatment was continued until July 6th, when gangrenous action commenced. The wound increased in size very rapidly. A solution of the ferri persulph. was applied, and a stimulating poultice of Peruvian bark and linseed was used as a dressing. This treatment was continued until July 12th, without beneficial effect, the wound still increasing. Bromine was then applied, which partially arrested the gangrenous action. During this time warm water dressing was used. On July 20th, on removing the slough, there was considerable hemorrhage; the ferri persulph. in solution was freely applied, and the stimulating poultices resorted to again. This treatment was continued till the gangrenous action was arrested, which took place July 26th. The granulations are now very healthy, and the patient is fast recovering. During the whole time he was well supported by stimulants, tonics, good diet, &c. &c.

Tissues involved—skin, cellular tissue, and muscle.

CASE VI. Cyrus Mann, private Co. A, 49th Ohio. Wounded June 26th, 1863, at Shelbyville. Admitted into General Field Hospital June 28th. Ball entered middle third of thigh on internal side, and came out on the posterior; general health was good, and the wound did well under cold water dressing until July 15th, when gangrenous action commenced. Bromine was immediately applied, and the action was arrested July 19th. The patient suffered very little from constitutional disturbance, and when transfered to Nashville, July 27th, was doing very well.

Skin and cellular tissue only involved.

CASE VII. Edward Cutshaw, private Co. A, 17th Ohio. Wounded June 26th at Hoover's Gap. The ball passed through the fleshy part just above the elbow and then entered the hip, knocking off a portion of trochanter of the femur. The patient had a slight attack of intermittent fever, from which he recovered about the 8th of July. The wound did well until July 17th, when the secretion was somewhat arrested and the odor not so healthy. It was washed with Labarraque's solution, and warm dressing substituted for the cold.

On July 18th the wound had increased in size, and gangrene developed. Bromine (pure) was applied, and the gangrenous action was arrested July 19th. The patient was supported by tonics, stimulants, and good diet. He is now in the hospital and doing very well.

CASE VIII. James Christie, private Co. C, 6th Indiana. Wounded June 26th, 1863, at Hoover's Gap. Admitted into the General Field Hospital, June 27th. The ball passed through the left nates. The wound did well until July 8th, when gangrenous action commenced. Bromine was applied three times without arresting it. A solution of ferri persulph. was then used, and the gangrenous action was arrested July 13th. He has since been transferred to Nashville.

The appearance of gangrene at this hospital would seem to confirm the views entertained by many, and with which I fully accord, that gangrene

is an essentially local disease. McLeod, in his *Surgery of the Crimean War*, says: "It never became general or severe. It did not appear to pass from bed to bed, but arose sporadically over the hospitals." And such was the case in our hospital. There was in the majority of cases little or no general disturbance of the health; often no pain or uneasiness of the part, and not unfrequently but one opening affected. There seemed to be a breaking down and undermining of tissue, without any swelling or thickening of parts by inflammatory deposits; the secretions became suspended or altered; and a dry brownish crust overspread the parts, involving skin, cellular tissue, and muscle which was easily separable from the sound tissue. The disease did not appear among broken-down subjects, but rather the contrary; nor did it seem, unless very extensive, to produce much prostration.

The application of the escharotics soon checked the progress of the disease. Nitric acid, bromine, and persulphate of iron were all used with advantage, but bromine seemed to meet our wants in the largest number of cases. Its application, though very painful, should be thorough. Great care should be taken in its application, which should be to the sound tissue, after separating the slough carefully. One application will often be sufficient, but a second and third is not unfrequently required.

The persulphate of iron is a good and efficient remedy, and much less painful in its application. I have had good results from nitric acid elsewhere, but I should give the preference to bromine, although it has failed in some cases.

Generous diet, with stimulants according to degree of severity of disease, and opiates are necessary adjuncts in the treatment of this disease.

Though many of the cases were severe in character, we are to congratulate ourselves with unheard of success. There was not one fatal case.

Of the *wounds of head and face* there is nothing of special interest to be said. They are often of the most frightful character, horridly disfiguring the face, and yet doing well. Balls take all directions with seeming impunity, and lodge in the most out of the way places, and lie harmless for a long time. The two classes of cases most alarming are where they fracture the arch of the skull, or take a course near an arterial branch.

In the first they are almost universally fatal, and as far as my experience goes in this and former campaigns, it makes little difference whether you trepan, remove depressed bone, or let them alone. Even the seemingly trivial cases, after a longer or shorter interval, die, with few exceptions.

Mr. Longmore, Prof. of Military Surgery at the Army Medical School, Netley, says: "Of seventy-six cases treated, where depression only, without penetration or perforation existed, fifty-five proved fatal, twelve were invalided, and nine only were returned to duty. Of eighty-six other cases where perforation or penetration of the cranium existed, *all died.*"

I can call to mind a soldier of the 6th U. S. Infantry, who was wounded, and a large piece of the parietal bone removed, who recovered. Also an

officer (Col. S.) who was wounded at the battle of Stone River, and who recovered after a gunshot wound of the head, with a loss by necrosis of a small portion of the right parietal bone. The wound was not entirely closed six months after, and he was unable to expose himself in the sun or to fatiguing duty.

Of the cases received, only the following one seemed to call for the use of the trephine.

Athal Achme, Co. I, 33d Indiana, was struck, June 26th, with a ball near the inferior and external angle of the left parietal bone, depressing about an inch square of the external plate, and a much larger extent of the internal.

The substance of the brain and meninges was torn. He had a wandering, unsteady gait, but was conscious though dull. The crown of the trephine was applied and all the loose fragments removed, several of which penetrated the substance of the brain.

He recovered well from the operation; slept, ate, and expressed himself as feeling comfortable; and all his symptoms promised well until about two hours before his death, July 3d, when he became comatose.

I regret to have to confess that all my operations for trephining have been unsuccessful thus far in this war; but Stromeyer tells us that during the three years he attended the hospitals of Vienna, London, and Paris, he had not met with a single successful case; and even in civil life, where the injuries are chiefly produced by blows or falls, and the patients have every attention of the highest surgical art, only one-fourth of the cases recover.

During the Crimean campaign, the trephine was applied successfully only four times, and not for gunshot wounds, by the English surgeons; and Dr. Scrive says that trephining was for the most part fatal in its results in the French Army.

Dr. Stromeyer declares that he has abandoned the practice.

*Secondary Hemorrhage: Ligation of Common Carotid Artery.*—Wm. Bryant, private Co. B, 17th Indiana Volunteers, June 25th, received a gunshot wound; the ball entered the left malleolar bone, and, passing through, fractured the palatine, superior and inferior maxillæ on the right side. He did well until July 5th, when secondary hemorrhage set in, which was checked by plugging and application of the persulphate of iron.

*July* 8. Profuse hemorrhage again occurred, and the common carotid artery was tied by Asst. Sur. McCullough, 77th Penn. Vols. No recurrence took place, and he progressed well, starting on furlough August 18th. Several loose pieces of bone were removed from time to time, and a slight attack of erysipelas occurred about July 27th.

*Shell Wound of Face and Arm.*—Sergt. A. Miller, Co. A, 2d Ohio Volunteers, was struck with a fragment of shell, tearing away a large portion of the soft tissues of the face, especially on the right side, destroying the eye, and fracturing the zygoma and inferior maxilla. He presented a horrid appearance. The soft parts of the right arm from the shoulder to

the elbow were terribly lacerated. Notwithstanding this amount of injury, he steadily improved and finally recovered. After healing it was found necessary to repair the loss of the right angle of the mouth by a plastic operation, so as to enable him to drink without the fluid escaping.

There was one *gunshot wound of the shoulder-joint.*

Sergt. James Fisher, Co. K, 17th Indiana Volunteers. A minié ball struck the shoulder on the outer and anterior side, passed through the head of the bone and behind the scapula, at Liberty Gap, June 25th. He was brought to Hospital No. 1, next day, in a very prostrate condition; but rallied during the next night, after being put in a warm comfortable bed, with good diet and anodyne. I found, on examination under chloroform, a comminuted condition of the head and neck of the bone, and resected. (See specimens in Museum.) There was little blood lost, and he seemed to do well, but sank after twenty-four hours, and died.

There were ten *comminuted fractures in shaft of the humerus*, of which two died; on both of whom resection had been performed; in one case by the surgeon of his regiment (2d Indiana Cavalry), and in the other by myself. Both cases promised admirably for a month, but finally feeling the influence of the poisonous atmosphere of the surgical ward of the Field Hospital, died of exhaustion. In another case of resection, George Dougherty, Co. C, 77th Pennsylvania Volunteers, I took away full three inches of the middle third of the left humerus. He entirely recovered, but his convalescence was retarded by a hemorrhage, which occurred a week after the operation, and reduced his general health very much.

The other cases (seven) recovered without any operative interference, as is usual in this character of injury. No cases give more satisfaction than those in which the surgeon can save an arm; and unless the parts are very much torn by shell or round shot, or the vessels and nerves injured, he may count upon a successful result.

The introduction of the plan for saving arms in cases of wounds of the elbow joint by exsection of a part or the whole, according to the extent of the injury, has in many cases saved arms which but a few years since I have seen fall before the surgeon's catlin; and I regret to say, I believe at this day I can see many a poor fellow with his stump whose arm could have been saved.

It has been urged that we are called upon to amputate in many such cases on the field, and the chances are better, especially where the wounded are obliged to be removed rapidly to the rear; but however good such reasons may be in gunshot fractures of the lower extremities, it cannot be applied to the upper.

Of four cases recorded, three were reported as recovering, without any other operation than removal of loose spiculæ.

In the other, private Daniel Long, Co. D, 77th Indiana Volunteers, I removed about two and a half inches of the ulna, including the olecranon.

The patient promised admirably for a month, but finally succumbed to the pyæmic poison at the Field Hospital.

All the wounds of the forearm and hand recovered without amputation, although many were of a severe character, and more than one through the wrist joint involving the carpal bones. In one case, three inches of the radius was removed, and the wound became gangrenous; but the patient finally recovered, with some use of his fingers; but so great was the destruction of muscular substance by gangrene, that his arm will not be of much value.

*Wounds involving the lungs* present to our attention cases of the most grave character, and, when we consider the importance of this vital organ, it is remarkable how many recover, with due care.

Eight cases are reported as received at this post, of which two died. All these cases were transported in ambulances, and presented alarming symptoms on admission; blood still expectorated, breathing short and hurried, anxious expression of countenance, and acute pneumonia getting in. It would be useless to give the individual history of each case and its course towards recovery. The principal means were digitalis and veratrum viride, extreme quiet, light diet, and avoidance of all excitement to mind or body.

In the case of adjutant Thomas, of the Confederate service, the ball passed in one inch below the middle of the clavicle and passed out posteriorly, fracturing the superior angle of the scapula; a loud bellows murmur was developed over the region of the heart and aortic arch, a few days after admission into hospital, which was explained by the fact that the ball had passed near this vessel or the left subclavian (he being wounded through apex of left lung). His condition was critical for a month, but he finally recovered, and was paroled to visit his friends in Nashville.

Private Charles H. Palmer, C. S. A., was admitted June 27th; a ball had entered the left side of the chest between the fourth and fifth ribs, one and a half inches to the left of the nipple, and made its exit two inches below the inferior angle of the scapula. He had bloody expectoration and pleuro-pneumonia. On July 27th a large accumulation of pus in the left pleural cavity was evacuated through an opening into the bronchi, and he suddenly threw up a quart or more of pus, which continued in small quantities until he was well enough to send to Nashville about Sept. 1st.

Private Barton Cook, Co. F, 89th Ills. Vols., was brought in, having received a gunshot wound of the lungs, the ball had entered on the left side, outside of the nipple, and, passing through, made its exit on the back on the right side of the tenth dorsal vertebra, and must have passed between the heart and thoracic aorta. On admission he had constant harassing cough and bloody expectoration, great dyspnœa, frequent full pulse, and flushed face. He passed through a dangerous succession of symptoms, with free suppuration, but in September he is recorded as "improving, discharge almost ceased, and walking about the room," and on the 19th as having walked down stairs and ready to go on furlough.

Other cases presented no important points of interest.

Four cases of *wounds of the hip-joint* are reported, of which two were

transferred to General Hospital at Nashville. Some doubt exists in my mind as to the accuracy of diagnosis in these cases, and I am inclined to regard them rather as fractures near the head of the bone. I have no history of the cases, and cannot recollect the particulars, though I should no doubt have done so had cases of so grave a nature been received, as it was my custom to visit every surgical case of interest in all the hospitals two or three times each week.

The third and fatal case was that of Captain Martin, 79th Ill. Vols. A minié ball entered the left hip opposite the great trochanter, passed inwardly through the head of the femur, and was reported to be there retained. He was brought to the hospital after a journey of thirty miles in an ambulance, and on arrival was very much exhausted. On the second day after, having rallied considerably in strength and spirits, he desired that an operation should be performed if considered necessary. He was rendered insensible by ether and an exploration made, by which it was discovered that the ball had passed through the neck of the bone, and the finger could follow its track, but no ball was felt—although the fissure could be detected which rendered the fracture complete, yet there was very little comminution and no displacement. It was deemed most proper to leave things as they were.

The patient recovered well from the anæsthetic influence, and presented no unfavorable symptoms until the third day after the operation, when he rapidly passed away.

It was discovered, after the operation, that the ball had passed through the thigh and made its exit near the anus in the cleft of the nates. (See specimen in Army Museum.)

The fourth case, and fatal, was Private W. C. Lesneur, of Confederate Army, who was admitted June 27th with gunshot wound on right side; the ball had entered opposite the great trochanter of the femur, passing inwards and backwards through the trochanter major and lodging. The finger could be passed into the inner side of the bone, but could not follow the track farther. As this patient was much exhausted by a long and fatiguing journey, no operation was deemed advisable.

He lingered along for a few weeks, although supplied with food and stimulants, and sunk rapidly, being at no time in a condition to warrant surgical interference.

On examination, eight hours after death, the ball was found to have entered the trochanter major, passing through it and the capsular ligament of the joint, carrying away a portion of the head of the femur, the round ligament, and posterior portions of the acetabulum, and to have lodged beneath the psoas magnus and iliacus internus muscle near the spine, where a large abscess was found filled with dark unhealthy pus. The ligamentous and cancellous structures in the vicinity of the joint were almost entirely absorbed, and the soft parts infiltrated with sero-purulent matter.

In such a case no operation, even if attempted, would have offered any chance of saving life, and would have without doubt hastened the fatal result.

The experience of the English and French surgeons in the Crimean war has led them to declare that the attempt to save gunshot wounds of the

thigh was so complete a failure, that MacLeod in his Notes winds up his history of this class of injuries by the following precept:—

"That under circumstances of war similar to those which occurred in the East, we ought to try to save compound comminuted fractures of the thigh, when situated in the upper third; but that immediate amputation should be had recourse to in the case of a like accident occurring in the middle or lower third."

Now these circumstances were, as mentioned by him:—

"During the greater part of the siege the means of treating these accidents, whether as regards food, bedding, clothes, or shelter, did not exist in camp; and to transfer them to the rear only made the fatal result the more certain, from the pyæmic poisoning which was sure to be set up by the transport. Thus, then, it came to be, that up to the period when things were improved in the camp hospitals and in the transport service, recovery from a compound fracture of the thigh was impossible, or nearly so, and that the best hope lay in an early amputation."

Not only the above causes operated, but the "scurvy-poison held command in their systems; most of the patients had either suffered from dysentery or were on the verge of falling into that disease; in fact their condition of health did not bear sickness or gunshot injury." Now just the opposite state of things existed in our army. The men had been at rest in camps about Murfreesborough for five months, warmly clothed, abundantly fed, with a wholesome allowance of potatoes and onions, and they were the pick of the entire force, at least seven thousand of the feeble, sick, and worthless being left behind in hospital or invalid camp, or having straggled to the rear after two or three days' march. Now any rules or principles derived from the experience of the Crimean war were not applicable in our treatment of injuries.

Our ambulances were easy and abundant, and the hospitals amply supplied with everything essential.

Under such circumstances we were prepared to exert ourselves for the preservation of limbs, and our success has been such as to warrant our efforts.

Thirteen cases of fractured gunshot wounds of the femur were received, of which five died. Of the five who died, three were amputated at the upper and middle third; one had resection performed of the middle third, and one died without surgical interference.

Two cases of resection were recovering.

Three cases where spiculæ were removed were recovering.

One case where there was no interference was recovering.

One case was discharged, and one sent on furlough.

In the six cases marked as recovering, two had been wounded at Stone River, December 31st, 1862, and were able to be up but not put any weight on the limb; the other four were wounded in the latter part of June, and on September 15th their wounds were nearly closed and every indication of bony callus having been deposited around the fractured ends.

I shall have another opportunity of presenting a very large number of cases in a future communication.

No class of surgical cases occur after a battle so important both to the surgeon and the soldier as wounds of the knee-joint.

A wounded man is brought into our hospital soon after he has received a ball through the knee-joint, fracturing bones, or coursing so near the joint as to involve the synovial capsule without any fracture. The man is in fine condition of health, and does not suffer any, and thinks his wound is not of much severity.

Shall we follow the experience and lessons cited in books, and immediately amputate above the seat of injury. One year ago I would have considered myself justified in doing so. At a meeting of the Army Medical Society, held in Washington, not a year since, the universal voice of the members present was to the effect that no case of recovery had occurred in their practice. Esmarch says :—

"In all gunshot wounds of the four greater joints of the extremities, in which the bone is at the same time injured, the question is only whether the limb shall be removed, or its preservation attempted by the performance of resection." Again, "All gunshot injuries of the knee-joint, in which the epiphysis of the femur or tibia has been affected, demand immediate amputation of the thigh. It is a rule of deplorable necessity already given by the best authorities, and which our experience fully confirms."

Guthrie states :—

"Every gunshot wound of the knee-joint when one or both epiphyses are struck, requires immediate amputation. He has not seen a single case recover without removal of the limb."

McLeod, in his *Surgery of the Crimean War*, says :—

"The knee, when penetrated by gunshot, presents an injury of the gravest description. Taking much interest in cases of this description, I visited every one I could hear of in camp, and can aver that I have never met with one instance of recovery in which the joint was distinctly opened, and the bones forming it much injured by a ball, unless the limb was removed."

With such precepts and experience I was slow to come to a conviction that very many cases which I had seen go on to an unhappy conclusion, might have been saved.

It seemed to me that the patients had not so much died from the injury itself as from timid surgery. A wounded joint within forty-eight hours begins to swell, and becomes tense, shiny, and painful, and soon fluctuation is felt within the capsule and exteriorly. This may be delayed for several days by cold applications. Matters go on from bad to worse; there is discharge from one or both wounds, but which does not relieve the distension. The general system finally succumbs, and after death we find the joint cavity and all the tissues above and below the knee with burrowing abscesses. It is a rule of surgery to give free exit to pus wherever it is detected, and more especially when beneath fibrous and unresisting tissues. Now, if we apply this good precept to the knee-joint as soon as we find distinct fluctuation, shall we not save the increase and spread of the pyo-

genesis? Shall we fear to freely open the knee-joint? Are we not told that shell wounds tearing open the joint are less dangerous than gunshot or punctured wounds?

Are not amputations and resections at the joints abundantly successful?

By such reasoning I had determined as soon as opportunity presented, to risk a trial to save a limb, and this occurred.

CASE I. Sergt. Haynie, Q. M. Sergeant 10th Ohio Cavalry, while on a foraging expedition, June 6th, a few miles from Murfreesborough, Tenn., received a gunshot wound of the left knee-joint; the ball struck the centre of the patella, and passed through, comminuting it; it then passed outward and backward, involving the articular surface of outer trochanter of femur, tearing the capsular and lateral ligaments.

He was brought to the Field Hospital immediately, and soon after seen by several surgeons. I recommended that the track of the wound should be laid open and a free incision made into the joint, the limb firmly fixed in a good position, and cold irrigation applied.

This was done effectually as soon as swelling and redness appeared, and the fragments of patella removed at various intervals. No pus was allowed to accumulate or burrow. Cold or warm water dressings were used, as most comfortable to the sensations of the patient. Everything progressed most favourably, and when I left the post,[1] Sept. 14th, the wound was nearly closed, and the patient had some motion of the joint.

CASE II. Adjutant Y. Caswell, Georgia Sharpshooters, C. S. A., was brought to the hospital, June 26th; a ball had struck the outer condyle of the femur, glancing downwards, opening the capsular ligament of the knee-joint, and made its exit in the leg, opposite the middle of the fibula.

The utmost rest of the joint and ice water applications seemed to strangle all excessive action; the wound suppurated kindly, and he was so far recovered as to allow his being sent to Nashville, July 27th.

CASE III. Capt. Pettigrew, 20th Tenn. Confederate army, was admitted the same date, with gunshot wound of the right knee-joint; the ball had entered above the external condyle, fracturing it and passing out posteriorly. For some days no inflammatory symptoms of severity occurred under complete rest and cold applications, and so comfortable was he, that he got out of bed and attempted to walk. This brought on active inflammation of the joint, with abscesses in and around it, and he suffered terrible pain. Extensive openings were made so as to thoroughly drain off all collections of pus, and he passed through the usual course of such cases, until Sept. 6th, when he began to improve, the discharge being diminished and more healthy, the swelling subsiding, his appetite and sleep good, and mind cheerful.

On Sept. 16th, the record declares him greatly improved and beyond all danger.[2]

*Nov. 25th.* Prospects of complete recovery with anchylosis.

[1] Nov. 25th. I have since learned that he went on furlough, the wound having entirely closed.

[2] Nov. 30th. Has just returned from furlough with a good joint and considerable motion.

CASE IV. Private Edward Phipps, Co. I, 6th Indiana, received a wound in the right knee-joint, July 5th; the ball entered on the outer side, passing through between the patella and articulations of the femur and tibia, and passing out on the inner and lower side. No fracture could be felt. He had considerable swelling and inflammation of the joint, but no abscesses, and Sept. 13th was furloughed with anchylosis of joint, and able to move about on crutches.

CASE V. Private Adam Loutenschlager, Co. A, 77th Penn. Volunteers, admitted June 27th, gunshot wound; the ball entered in front near the attachment of the biceps, above the patella, and penetrated the joint. The ball was extracted at the hole of entrance. Ice water dressings were applied to joint with absolute rest; active inflammation set in, attended with purulent deposit in the joint and burrowing up the thigh. Free incisions were made, but later than I could have wished, evacuating unhealthy pus. Bandages were applied above and below the knee, and the most nutritious diet with stimulants freely given. Two months of suffering, with great prostration, enormous discharges of pus, and extreme emaciation, were rewarded by a fair prospect of the limb being saved, and Sept. 15th, the patient is recorded as "improving and the discharges from the knee almost ceased." It was thought by the surgeon in charge of the hospital that "he would recover with an anchylosed joint, and the limb nearly straight."

Ten cases of wounds of the knee-joint were admitted (all except Sergt. Haynie) into Hospital No. 1, from the several skirmishes of the advancing army.

Of these three died without operation; one died after amputation; one died of secondary hemorrhage from a branch of the popliteal artery; three were nearly recovered when I left the post, Sept. 15th, and two remained with fair chances of ultimate recovery. Thus we have one-half the cases which will in all probability be saved with useful limbs and various amounts of motion in the joints.

These cases were treated under the most favourable circumstances; the physical condition of the men was most excellent, and soon after the reception of the injury, they were taken to well appointed hospitals, surrounded with comfort, and with every luxury of diet at command, and skilful surgical attendance.

From the unsatisfactory histories furnished me, I am unable to give the details of all the cases; but having been in the habit of seeing them from day to day, I know that three recovered and two promised well; then I was ordered to the front, in anticipation of a battle at Chattanooga. I hope to be able to give more accurate and enlarged notes of the vast number of such cases resulting from the desperate conflict on the Chickamauga.

In conversation with surgeons, several successful cases have been related, and Surg. Goldsmith, U. S. A., at Louisville, related, as a curious fact, that more men have been discharged the service at that post who had received gunshot wounds of the knee-joints with recovery, than where amputations of the thigh had been performed for various injuries.

Injuries of the ankle and foot, involving more or less destruction of the bones, are among the most formidable presented to us after a battle, and from the small amount of apparent destruction, we are induced to give a trial for the conservation of the limb, nor can we at all judge what is going to be the course of the injury, not unfrequently the most formidable go on to a happy termination, while less severe cases result in destruction of all the bones, ligaments, and coverings.

I have been greatly delighted at the result of several of our cases, where I was in great doubt whether they could be saved, and have turned away unresolved what to do. I have more than once been the only opposing voice to amputation, and have rarely if ever had reason to regret my decision.

Six cases of ankle-joint injury and others of the foot were treated and with admirable results; in no case was amputation necessary.

I subjoin the history of two cases:—

Private Henry Hartman, Co. I, 34th Illinois Volunteers, admitted with compound comminuted gunshot wound of left ankle-joint and foot, the ball entering two inches above the internal malleolus and passing out at the inner point of the heel, through the joint and fracturing the malleolar process.

Ice-water dressings, with elevation of foot, free incisions to prevent burrowing of matter, were the means resorted to; violent inflammation followed with great pain for some time, which yielded to the appropriate treatment, and his improvement was rapid, considering the extent and gravity of the wound.

He was walking about on crutches with his foot slung, early in September, and went home on furlough. He will in time have good use of his foot and ankle.

Private A. P. Witson, Co. K, 58th Indiana Volunteers, was admitted June 27th, with compound fracture of the left foot, ball entering at lower end of second metatarsal bone, passing diagonally to the inner, back and lower point of the heel, where it made its exit, fracturing the second and third metatarsal bones, lacerating the tendons and ligaments of the foot extensively in its passage.

The same general course of treatment was adopted, with removal of fractured pieces from time to time.

He did well, and in September was going about on crutches with best prospects of a complete healing of parts and ultimate use of his foot.

Fractures, by minié balls and shells, of the bones of the leg, except in cases of great destruction, are very favourable. Resections and removal of large pieces result in renewal of the parts, and every surgeon is familiar with the success of conservatism in this part.

There were performed on the field and sent into hospital—

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Amputations of the arm | . | . | . | 1; | of which died | 0; | remaining | 1 |
| " " shoulder | . | . | 1; | " | " | 1; | " | 0 |
| " " leg | . | . | . | 2; | " | " | 1; | " | 1 |
| " " mid. 3d thigh | . | 2; | " | " | 1; | " | 1 |

There were performed after admission into the hospital—

| | | |
|---|---|---|
| Amputations of | left leg | 1 |
| " | low. 3d thigh | 1 |
| " | mid. 3d " | 1 |
| " | knee-joint | 1 |
| " | trephining | 1 |
| Ligature of | femoral artery | 1 |

All of which were fatal.

One case of ligature of the carotid (external) was successful.

All these were secondary operations performed from two to six weeks after injury, and all but the cases of ligation of arteries and trephining were in the field hospital, where depressing causes alluded to above existed, and which explains the great mortality.

MURFREESBOROUGH, TENN., Nov. 25, 1863.

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ART. IV.—*A Description of some Instances of the Passage of Nerves across the Middle Line of the Body.* By JEFFRIES WYMAN, M. D., Hersey Prof. of Anatomy in Harvard College.

BICHAT appears to have been the first anatomist who pointed out the existence of a communication between the peripheral nerves of the right and left halves of the body. He has not entered into any descriptive details of it, and the substance of what he says may be found in the following words:—

"Sometimes two nerves of the same pair, or those of two different pairs, but from each half of the nervous system, unite on the middle line, examples of which are seen in the superficial nerves of the neck, in those of the chin, &c. This union does not take place on the abdomen, where the middle line, entirely aponeurotic contains no nervous branches in its tissues. It is, perhaps, by these anastomoses, that the persistence of motion in certain paralyzed parts can be explained. They are, however, quite rare." * * * "If each nerve had them it is evident that hemiplegias could hardly take place, for the healthy side of the brain or of the spinal cord could influence through them the nerves of the diseased side."[1]

Meckel[2] and Beclard[3] subsequently announced similar views with regard to

[1] Bichat, Anat. Gén., t. i. p. 133. Paris, An X. (1801).

[2] Meckel admits three kinds of anastomosis; the first and second are found on one and the same side of the body; the third is between two homonomous nerves from opposite sides, as in the subcutaneous branches of the fifth and of the seventh pairs, or between some of the nerves of the neck.—*Manuel d'Anatomie*, t. i. p. 229. Paris, 1825.

[3] "Anastomoses sometimes take place between branches of the same nerve, sometimes between different nerves, and more rarely between nerves of one side and those of the opposite side."—*Elements of General Anatomy.* Translated by Robert Knox, M. D., p. 346. Edinburgh, 1830.

the union of the two valves of the nervous system at certain points, but describe it only in general terms.

Cruveilhier, in commenting upon the opinions of Bichat, appears to have misunderstood him, and implies that Bichat asserted the existence of anastomoses along the whole length of the median line ("*les anses nerveuses que Bichat indique sur tous les points de la ligne mediane du corps.*"[1]) We do not find any proof of the correctness of Cruveilhier's impression, either in the passage first quoted, nor elsewhere in the writings of the great French anatomist. Having denied the existence of such communications, Cruveilhier says: "The only anastomoses on the middle line with which I am acquainted, are those of the pneumogastric, behind the lower end of the trachea, that of the two solar plexuses, and that of the cardiac nerves."[2] He, however, omits to add that of the phrenic nerves, of which he makes especial mention on another page.[3]

Vogt, in his account of dissections of the nervous system of reptiles, describes and figures the anastomosis of the hypoglossal, xii., in the tongue of the alligator, *Champsa sclerops*.[4]

Hyrtl, the most accurate and pains-taking of living anatomists, in his description of "endless nerves," notices especially the anastomosis of the right and left hypoglossal in the fleshy portions of the genio-hyoid muscles.[5] Hirschfeld and Leveillé, in their Iconography of the Nervous System, describe and figure the anastomosis of the lingual branch of the trigeminus at the tip of the tongue, also that of the phrenic in front of the pericardium.[6] Many other anatomists have made mention of one or more of these nervous communications, but it is unnecessary to cite them.

Drs. S. Weir Mitchell and George R. Morehouse, in their admirable *Researches on the Anatomy and Physiology of Respiration in the Chelonia*, have shown that the upper laryngeal nerves not only communicate with each other, but form a symmetrical chiasma across the fore-part of the larynx, and have experimentally demonstrated, that by means of this chiasma, each laryngeal nerve exerts an influence over the muscles, both of the same and of the opposite side. In connection with these observations they say, "This remarkable nerve furnishes the only known instance in nerve anatomy of an extra cranial chiasma."

In attempting to verify the results of Drs. Mitchell and Morehouse, we have been led to examine other animals, and find that the chiasma proved by them to exist in the turtles, is present also in the iguana, python, and alligator among reptiles, and among birds in the ducks and geese. As it

[1] Anat. Descriptive, t. iv. p. 437. Paris, 1845.

[2] Ibid., p. 437.

[3] Ibid., p. 492.

[4] Beiträge zur Nevrologie der Reptilien, p. 44, pl. iv., fig. 2. Neuchatel, 1840.

[5] Nat. Hist. Review, vol. ii. p. 97.

[6] Nevrologie, ou Description et Iconographie du Système Nerveux, par MM. Ludovic Herschfeld et J. B. Leveillé, pl. 41, fig. 2, and pl. 91, fig. 4.

differs but little, in the animals just mentioned, from that already described in the turtles, a general account of it is all that will be necessary. It should be borne in mind, however, that the movements of the larynx are controlled by a similar set of muscles in all of them, viz., by a pair of constrictors, or arytenoids (Figs. IV. and V., *a*), sometimes so intimately connected as to appear as a single muscle, and a pair of dilators, or crico-arytenoids, exterior to and crossing the preceding in a nearly vertical direction (Figs. IV. and V., *b*). It is, probably, in consequence of this similarity of muscular arrangement that the distribution of the nerves in the larynx is so nearly the same in all.

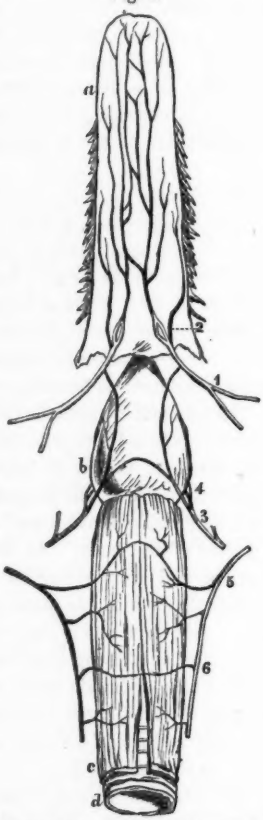
*Laryngeal Tracheal Chiasma in Birds.*—This has been carefully studied in ducks and geese. In order that it may be fully understood, it will be necessary to begin with a description of the glosso-pharyngeal nerve at the place where it escapes from the cranial cavity. This nerve, as far as it has been examined, when it leaves the cranium receives, in most birds, a large communicating branch from the vagus, which, from the subsequent distribution of the nerve which it joins, and from there being no separate branch corresponding with the upper laryngeal, must be considered as forming, or at least containing, this last mentioned nerve. Near the point where the two nerves are thus united a branch is given off which is directed forwards, and a little lower down a second, which follows the course of the hyoid bone, unites with the preceding (Fig. I., 1), and enters the base of the tongue. In its distribution through the tongue we find a very marked instance of a connection between the nerves of the two halves of the body. As the right and left nerves enter the base of the organ, and after giving off a large branch to the salivary glands (2), the trunks divide into two strands, which almost immediately come together again; each trunk then extends along the whole length of the tongue near the median line, giving branches outwards to the borders, and inwards others, of which about six are continuous from opposite sides across the long axis of the tongue. These nervous communications are oblique, unsymmetrical, and contain numerous nerve-tubes, especially the one near the base, which is much the largest.[1]

The terminal portion of the glosso-pharyngeal (3) after giving a small branch to the œsophagus, passes to the side of the larynx. There the trunk, which must now be considered as consisting wholly of the upper laryngeal, supplies, by its posterior branch (4), the muscles of the larynx and the mucous membrane in and near the glottis; it then becomes united with its fellow by means of a symmetrical but quite slender chiasma. This is smaller than either of the trunks which it connects, and from this circumstance it seems probable that the influence of each nerve on the mus-

[1] In the class of birds generally the glosso-pharyngeal supplies the tongue with all of its sensitive branches, unless there be a few fibres combined with it from the vagus. The lower maxillary branch of the fifth gives off no lingual branch. Among reptiles the same is for the most part true.

cles of the opposite side would be less than on those of the same side. From each angle of the chiasma a slender nerve passes forwards, giving a slender filament to the laryngeal muscles, and at last unites with the lingual branch of the glosso-pharyngeal, 1.

Fig. I.




NERVES OF THE TONGUE AND LARYNX IN THE GOOSE.—*a*, the tongue; *b*, the larynx; *c*, the long tracheal muscles; *d*, the trachea; 1, glosso-pharyngeal nerve; 2, branch to the salivary gland; 3, upper laryngeal nerve and decussation; 4, branch to laryngeal muscles; 5 and 6, the two decussations of hypoglossal.

The preceding description is drawn entirely from the goose. In the duck the chiasma of the laryngeal has a similar structure, but the decussations of the lingual nerve are mostly confined to the central part of the tongue. The trunks of the nerve in the forepart of the organ are separated by a fibrous raphé, across which no filaments were traced.

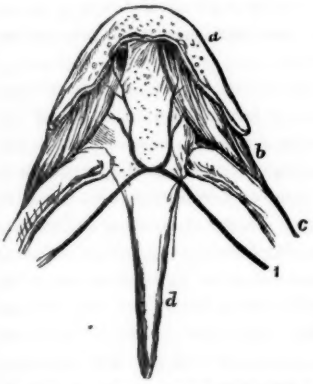
On tracing the hypoglossal nerve to the long muscles on the front of the trachea, decussations of the right and left nerves are easily demonstrated. Two of these are represented in Fig. I. at 5 and 6.

In dissecting from the detached larynx of the African ostrich, the lingual nerve, which, in its distribution, corresponds with, and undoubtedly is, the glosso-pharyngeal, no chiasma was detected in the usual place, though it is possible that it may have been accidentally destroyed in the removal of the organs. The right and left nerves, after having supplied the muscles and mucous surfaces of the larynx, advance to the tip of the tongue, where they anastomose very freely, the two trunks forming a continuous arched nerve across the middle line.

The hypoglossal nerve differs quite remarkably from the same part in the other animals here described. The nerves (Fig. II., 1) following the horns of the hyoid bone (*c*), converge towards the body of it (*d*), and between the bases of the horns, and on the under or fore side of the body, form a very short, but perfectly distinct and symmetrical chiasma, measuring only the one-tenth of an inch in length. From each angle of it a nerve passes forwards, the branches of which are distributed to the muscles of the

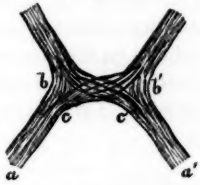
tongue. This structure and distribution of the hypoglossus in the ostrich resembles that of the same nerve described by Vogt as existing in the alligator.[1]

Fig. II.




TONGUE AND A PORTION OF THE HYOID BONE OF THE OSTRICH.—*a*, a portion of mucous membrane of the tongue; *b*, hyo-glossus; *c*, cornu of the os hyoides; *d*, body of the same; 1, hypoglossal nerve and chiasma.

Fig. III.

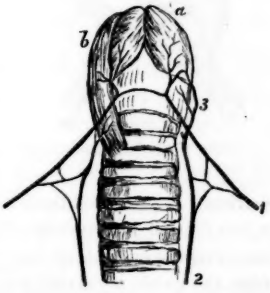



Chiasma of the hypoglossus in the ostrich.

The chiasma (Fig. III.), when examined under the microscope, is easily resolved into two sets of fibres. Each nerve trunk (*a*, *a'*) divides into two bundles, one of which passes directly forwards to the muscles on the same side (*b*, *b'*), and the other (*c*, *c'*), crosses to the opposite side. As the bundles pass each other in the chiasm, the fibres become somewhat separated and spread out. The number of fibres in the direct and decussating bundles are about the same, therefore the influence of each nerve on the muscles of the opposite, is, undoubtedly, equal to that on those of the same side with itself.

*In the Python.*—As the larynx upon which this dissection was made had been cut away from the surrounding parts, the connections of the laryngeal with the other nerves were not traced. The recurrent, Fig. IV., 2, and the upper laryngeal, 1, form a small plexus by an interchange of fibres before they reach the larynx. The chiasma between the right and left branches of the upper nerve is much more slender than in either of the other animals here described, and was traced with great difficulty. The terminal branches of the nerve are distributed

Fig. IV.



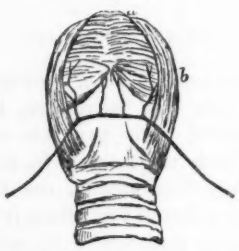

LARYNX OF PYTHON.—*a*, constrictor of the glottis; *b*, dilator; 1, upper laryngeal nerve; 2, lower or recurrent nerve; 3, communicating branch between the upper and lower nerves; the left dilator is removed.

[1] Ibid., pl. iv., fig. 2.

to both the contractors, *a*, and the dilators, *b*. The recurrent nerve is mainly distributed to the dilators, or crico-arytenoids, as in turtles, but in addition forms a communication with the superior laryngeal by means of a very slender filament, 3, which lies beneath and is concealed by the muscles just mentioned. In this case the chiasma is so slender that it seems improbable that either laryngeal nerve should exercise as much influence on the opposite as on the same side with itself.

*In the Alligator.*—As in the preceding, the dissection was made on a detached larynx. The chiasma is relatively larger than in either of the other instances; is of the same size as the trunks which contribute to the formation of it, and is protected by a very thick sheath of white fibrous tissue; in addition to branches of nerves distributed to the muscles as in the python and the birds, two others are given off near the median line, which perforate the walls of the larynx and are distributed to the mucous membrane within. The recurrent nerve was not traced.

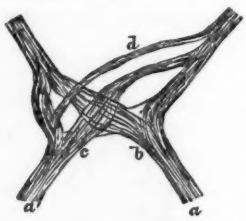
Fig. V.




LARYNX OF ALLIGATOR.—*a*, constrictor; *b*, dilator; 1, laryngeal nerve and chiasma.

Drs. Mitchell and Morehouse have inferred from the crossed influence of the nerves on the muscles of the larynx in the turtle that there is a decussation of fibres. "Part of each nerve probably proceeds directly to the glottic muscles of its own side, while another strand crosses over through the interlateral trunk to be similarly distributed to the two muscles of the opposite side."[1] We have made a microscopic examination of the chiasma of the laryngeal nerve in the iguana (Fig. VI.), and find their inferences fully confirmed; the structure of it being, in its essential features, like that of the hypoglossal nerve in the ostrich. It presented the following irregularity: The fibres from the trunk, *a*, are divided into two strands, one of which passes forwards on the same side, and the other, *b*, crosses in a single mass to the opposite side. Those from the trunk, *a'*, divide into three parcels; one going forwards is separated from the decussating fibres of *a* by an interval filled with fatty matter; a second, *c*, crosses to the opposite side in a manner nearly symmetrical with *b*; and the third, *d*, the smallest, crosses still further forwards. These two comprise all the decussating fibres from *a'* toward *a*. As the bundles *b* and *c* pass each other, their fibres become separated and spread out after the

Fig. VI.




Chiasma of the laryngeal nerve of the Iguana.

[1] Researches, p. 35.

manner of nerve fibres in a ganglion. The fibres of *d* pass over the chiasma free. This arrangement gives an unsymmetrical character to the parts, but is most probably only an individual peculiarity.

It appears from what has just been stated that various peripheral nerves from opposite sides of the body form decussations with each other, all of which can be traced by dissection without the aid of the microscope, or at most requiring that of a very low power. The nerves which contribute to such interchanges of filaments are the fifth, the hypoglossus, the laryngeal, and post-tracheal branches of the vagus, the phrenics, and the sympathetic. Drs. Mitchell and Morehouse have demonstrated what had not been previously observed, that in turtles the upper laryngeal nerves form a symmetrical chiasma, to which the right and left trunks equally contribute. Following the lead of their investigations, we have found a similar arrangement in the iguana, python, and alligator, among reptiles, and among birds in the duck and goose, rendering it quite probable that it may be found generally among the two classes of animals just named. We have not found it in the ostrich, and have looked for it without success in a few mammals. We have further ascertained that the hypoglossal nerve of the ostrich forms a chiasma, quite as remarkable as that of the laryngeal in either of the animals which have been previously mentioned in this communication.

The inquiry naturally presents itself here whether these are the only instances, and whether decussations or anastomoses of less size, occurring between terminal filaments of nerves, but too small to be detected, except by the aid of the microscope, do not exist elsewhere on the anterior and posterior median line. We find no notice of such communications in the text-books of histology commonly in use, and no mention of them either in the works of Kolliker, Virchow, or other more recent writers on microscopical anatomy.

To answer the question thus raised we have made our examinations for the most part on the skin of the abdomen, and on the mucous membranes of the roof of the mouth of the frog and the skate. These parts were chosen on account of their thinness, and the absence of pigment, two conditions of great importance to the successful investigation of their minute structure. The parts to be examined were treated in the first instance with dilute nitric acid, in order to make the nervous fibres opaque, then carefully washed in water, and just before being placed under the microscope immersed in a solution of caustic soda. This renders all the other tissues highly transparent. Adopting this method, we have been able to trace, with ease, the course of the nerves through the whole thickness of the skin, without being obliged to have recourse to sections by which the natural arrangement of parts is often too much disturbed to admit of correct study.

The following are the appearances which have been frequently observed

in the nerves as the two halves of the peripheral system come together. The different nerve trunks of small size, and of one and the same side, as they approach the median line, interchange fibres very freely, making an intricate plexus, which forms a network not unlike that of the capillary bloodvessels. The nerve-angles which result from the division of a trunk into branches are formed either by two bundles of fibres diverging from each other as in all the larger nerves, or by three, the third bundle passing along one of the branches to the point of separation, and is then reflected off into the other. The fibres of these different bundles become so intermixed that we have found it impracticable to follow them, except for a very short distance, from the angles. In the immediate neighbourhood of the median line the number of fibres in a nerve gradually diminishes, and there may be as many as twelve, or as few as two or three or even one. It is by such as these that right and left halves of the peripheral system are connected.

Fig. VII.

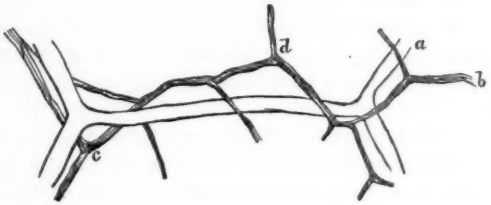
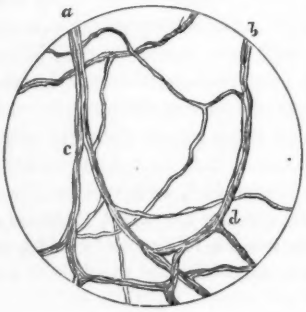



Fig. VII. represents one of these communications between the two sides, seen in the skin of the abdomen of the frog, following, as is very frequently the case, one of the small bloodvessels, *a*; *b*, the trunk of a nerve; *c* and *d*, nerve-angles of three bundles of fibres. Fig. VIII., *a*, nervous plexus from the under side of the head of a skate, *Raia batis*; *a* and *b*, two nerves, one on the right and the other on the left of the median line; *c*, a nerve-angle of two bundles of fibres; *d*, a nerve-angle with three bundles. Between the two trunks, *a* and *b*, are various communicating branches. The interchange of fibres in this specimen is greater than is commonly the case, especially at the lower part of the figure. Nevertheless we have succeeded in tracing, without difficulty, communications of different degrees of complexity, between the right and

Fig. VIII.



left halves of the nervous system, at almost every point on the roof of the mouth and in the skin of the abdomen in frogs, and in various parts of the integuments of the under side of the body in skates.

Physiological questions of considerable importance grow out of the anatomical conditions described above. The experiments of Drs. Mitchell and Morehouse prove that certain motor fibres actually do cross the median line and influence muscles on the side opposite to that of the half of the central axis from which they arise. The extent of their influence, it is true, is confined within very narrow limits. Have the sensitive nerves an analogous relation to the two sides of the body? May an impression made upon a given point on the skin be carried to the chord across the median line? We are aware of no experiments which give an answer to these questions. The answer from pathology as far as it goes is in the negative. Dr. Copeland expresses himself distinctly in the following words: "The more extended forms of partial anæsthesia generally appear in one half of the body, hemiplegic anæsthesia, and is limited with precision by the median line."[1] It is to be borne in mind, however, that few writers appear to have made the precise limitations of paralysis of sensibility a special subject of study. New investigations are required to enable the physiologist to form a decisive opinion as to whether the boundaries are in all cases so precise.

There is another question which seems to us an appropriate one here. Do the fibres under consideration, or some of them, pass entirely around the front of the body and enter the chord on the side opposite to the one from which they started, and thus come into the category of "endless nerves?" That this supposition is not improbable is shown by the facts, long since established by Volkman, Gerber, J. Müller, and others, that in each lateral half of the body certain nerve-fibres pass out to a greater or less distance from the chord, and then without having become connected with any tissues return to it either on the same or on an adjoining trunk, forming what Henlé calls "nerves without peripheral expansion." The observations of Newport, on the nervous system of articulate animals, show that certain nerve-fibres pass through the ganglion from side to side, having no end. And the more recent observations of Lockhart Clarke, and Deane, demonstrate an analogous fact in the human spinal chord. May not the peripheral system have its analogous loops?

*Note.*—Since the above communication went to the press we have met with two other instances of a union between the right and left hypoglossal nerves; one in a seal, *Phoca vitulina*, just below the larynx, passing symmetrically across the whole front of the trachea; and a second in the "pinnated grouse," *Tetrao cupido*, where the communication was found

[1] Med. Dictionary, article Paralysis, vol. vi. p. 13, American edition.

in two individuals, and in both made by means of an oblique trunk, descending from right to left, across the trachea just below the larynx, passing, in its course, over several tracheal rings, and thus differing from the other instances in having an unsymmetrical arrangement.

The following citations may be added to those already given:—

Bach (*Annotationes Anatomicæ de Nervis Hypoglosso et Laryngeis, Dissertatio Inauguralis*, Turici, 1834) states that, in the dissection of thirty-two human bodies, he found between the genio-hyoid and genio-glossus muscles, an anastomosis of the right and left hypoglossal nerves three times.

Cloquet (*Traité d'Anatomie Descriptive.* Paris, 1828, t. ii. p. 129) describes a communication between the right and left laryngeals in the mucous membrane of the interior of the larynx; also one between the non-palatine nerves in the foramen incisivum.

T. Miller (*Berlin Transactions*, 1835) describes the anastomosis of the organic nerves on the dorsum of the penis.

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ART. V.—*On the Disease produced by the Trichina Spiralis.* By WM. KELLER, M. D., of Darmstadt, formerly of Philadelphia.

THE comparative frequency in Germany of the recently discovered disease produced by Trichina, has induced me to collect the following facts in regard to it:—

*Discovery of Trichina Spiralis.*—MR. T. Hilton, Demonstrator of Anatomy at Guy's Hospital, found, in 1832, in dissecting the body of an old man, who had recently died of a cancerous affection, a large number of small white bodies, dispersed in the substance of the voluntary muscles. On a close examination he found them to consist of oval calcareous cysts. He first described them in the *London Medical Gazette*, in 1833, vol. xi. p. 605. He believed that the cysts belonged to a new class of intestinal animals, and were of no important consequences to the human system. In 1835, Mr. R. Owen found a small filiform animal in the capsule (a fact which Mr. J. Paget, then a student, had already suspected). Considering the animal a new one, he called it Trichina spiralis. By careful examination, the animal will be found more or less frequently in the dissecting-room. At first, the Trichina spiralis was considered as quite low in the animal scale; but afterwards, on a closer examination, a mouth, stomach, intestine, anus, and even perfect genital organs were observed. Some naturalists regarded them as perfectly organized animals; but the majority, misled by the discoveries of Siebold and Dujardin in 1844, believed them

to be forms of animals in a transitory state, which were destined for a higher development. The discovery of Küchenmeister, in 1852, that, by feeding, cysticercus was changed in tænia, seemed still more to sustain this belief; and, led by the similarity of the organization, he considered himself justified in the conclusion, that trichina spiralis was the primitive state of trichocephalus dispar. Prof. Leuckart's assertion, that, in America, raw pork was considered a cause of this intestinal worm in the human system, seemed to afford additional proof of this. The latter now made a number of experiments by feeding warm-blooded animals with trichina. First he used mice for that purpose, and found, on the third day, the intestinal animal free, out of its shell, increased to double its former size; but on finding afterwards, in a pig, which he had used for that purpose, a number of trichocephalus dispar in a perfectly developed state, he was strengthened in his former opinion. Prof. Virchow published (*Archiv*, bd. xviii., hft. iii.–iv.), soon after, the result of his experiments on the subject, in which he had found a number of nematodes in the intestines. These he believed to be the descendants of trichina spiralis, but only in a transitory state, which would progress to their highest organization in the muscular fibre, enveloped by the shell. Prof. Herbst (*Gœtt. Nachr.* 1852, Niz. p. 183) was the first to discover, by his experiments, that the trichina spiralis was changed into a free animal, reproducing young ones (then called intestinal trichina), which migrate again to the muscles of the individual. Prof. Leuckart (*Untersuchungen über Trichina Spiralis*, 1860), by his extensive experiments, has since confirmed this, and of course proved that trichina spiralis is perfectly distinct from tricocephalus dispar, or any other intestinal animal. He fed first three dogs, each with one pound of meat, containing, according to his calculation, 300,000 encysted animals, measuring 0.4–0.5 mm., or about $\frac{1}{6}$ of a line. Soon after he perceived derangement of digestion, which disappeared in a few days. The fourth day, on killing one of the dogs, he found a considerable portion of the bowels inflamed, and numberless animals, which had increased to such a size that he could perceive them even by the naked eye. With the microscope he distinguished, without any difficulty, in some eggs, in others sperm. The eggs attained their perfect maturity in the body of the female, of which he was able to count over 100. The calcareous shell, of course, had disappeared, and he was able to follow the young ones, whilst they migrated through the intestines to their entrance into the muscular fibre, where he observed them sometimes partly entered, in other cases already in their resting-place, and once or twice convoluted. The calcareous shell is produced by changes in the muscular fibre, which, by the penetration of the animal, loses its peculiar structure, contracts around the parasite, and becomes changed into a calcareous shell. There are sometimes more than one animal in a cyst, which, on irritation with a diluted solution of potash, exhibit motion. They are always coiled in one

direction, as had already been ascertained by Bristowe and Rainey. (*Transactions of the Path. Society of London*, vol. v. p. 277.) A number of the animals pass through the alimentary canal without any change.

*Description of Trichina Spiralis.*—This parasite belongs to the family of the Nematoidea, and has, according to its state of development, a length of $\frac{1}{25}$ to $\frac{1}{4}$ of a line. By a power of 600 diameters, in transparent specimens, a pointed mouth and an obtuse anal end may be seen. The former is connected by a tube (œsophagus) with a sac (stomach), and from this another straight tube (intestine) leads to the anal opening. (*Virchow's Archiv*, bd. xviii., hft. iii.–iv., tables ix. and x.) The females are larger than the males, and contain the ovaria and the eggs in tubular organs, which expand towards the posterior end of the body, along the intestine; but they are smaller towards the anterior part, which contains the enlarged stomach, and have, at the anterior third of the body, their opening. The males are smaller in the same proportion as the size of their genital organs is less than that of the females. Their internal organization is similar, except in regard to the seminiferous organs, which reflect towards the posterior part of the body, and unite, by an enlarged opening in the sac, and finally with the anus, where are found two chitinic protuberances. Having no need for respiratory and masticatory organs, the animal does not possess them. Three or four days after the trichina spiralis has been introduced into the stomach of a warm-blooded animal, the females produce 100 or more young ones, which begin, on the sixth day, to leave the parent animal; and as there have been found 300,000 in half a pound of meat, the stomach and intestinal canal of a person may, in a few days after the ingestion of such an amount of meat, contain 30,000,000 individuals of trichina spiralis, the proportion of the males to the females being so small as 1 to 10 or 20, and, in a later period, even 1 to 40, and the number of young ones taken at the lowest figure.

*Description of the Disease.*—The disease produced by the perforation of the intestines by the trichina spiralis has been observed, and, as we shall see, was even described some time ago without the author's, however, understanding the real cause of it.

Prof. Zenker, of Dresden, was the first to recognize the real nature of this disease, which he did in describing the following case:—

A servant girl, twenty years of age, was admitted, on the 20th of January, 1860, into the Jacobs Hospital, which is used for clinical lectures. She had been sick for four weeks, and had been obliged to keep her bed for the last three. At the beginning of her sickness, she had suffered with great debility, sleeplessness, want of appetite, and fever. At the time of her admittance, she had a great deal of fever, the stomach was considerably expanded, painful to the touch, and she had, at the same time, obstinate constipation. Soon afterwards she felt great pains in the muscles, particularly in those of the arms and legs, so that she was complaining of them day and night. At the same time she kept her arms and legs con-

stantly flexed, and every effort of extension was very painful. A few days later œdema supervened, particularly of the lower extremities, and she died the 27th of January, with symptoms of inflammation.

All the symptoms of the disease corresponded with those of typhoid fever, except in regard to the spleen, which showed no increase in size. On post-mortem examination, numberless trichinæ were found in the voluntary muscular fibres. A small portion of mucus of the ilium showed, under the microscope, perfectly developed trichinæ. The real cause of the disease was furnished Prof. Zenker by the information that, a few days previous to the sickness of the girl, the people with whom she lived had killed a pig, whose hams and meat, used in sausages, showed by a microscopic examination, an infiltration of a large number of trichinæ spirales. At the same time it was ascertained that the butcher who had been employed, had also been affected for three weeks with a painful attack of gout, which kept him for that time paralyzed, and which was believed to be the result of a cold.

Since that time a great number of cases have been observed, sometimes single, oftener quite a number together. It is not my purpose here to narrate all of them; but shall refer to a few as they serve to illustrate the phenomena of the disease.

In 1860, three individuals were affected in Corbarch, Waldeck, after eating raw meat finely cut, and sausage. They manifested the symptoms of typhoid fever, with great pains in the stomach and muscles. All three recovered.

There occurred in 1862 a number of cases in Plauen, a town in the kingdom of Saxony. Drs. Bœhler and Koenigsdoerffer, the physicians of the town hospital, examined under the microscope at first a small piece of the gums of the patients, without being able to discover any of the animals, though on excising a small piece of the muscular fibres of the arm they observed readily in it the trichinæ moving lively. According to the publication of Dr. Bœhler, he has observed thirteen cases, and ten or twelve besides occurred in the town at the same time. One-fifth of them were very severe, though with the exception of one, all got well, some only four months after the first symptoms; the subject of the fatal case was a female, who died after two months of great suffering with dropsy.

A number of cases also occurred in 1862, in Kalbe, in Prussia, of which nine were in males and twenty-five in females, and four in children; eight terminated fatally, the others had all more or less severe suffering.

A number of cases occurred lately in Hettstadt, a town of five or six thousand inhabitants in Prussia, famous for its mining region. The disease broke out in the middle of last October, and was produced by the consumption of sausages in a half cooked state. The diagnosis was confirmed by taking out small quantities of voluntary muscle by the harpoon invented for that purpose by Middeldorpf, and on microscopic examination, the trichina spiralis was everywhere detected. I was induced to make further inquiries respecting this disease in consequence of the death from it

of a Mexican whose relatives reside here. An intelligent physician, Dr. Müller, of Homberg, who was a near relative of the deceased, gave me the following particulars of his case:—

"In the evening of the 9th of November last I was summoned by a telegram from the physician of Hettstadt, informing me that a relation of mine was suffering from the trichina disease; that he had also a pneumonic affection, and was very ill. On my arrival on the following day I found the patient—who previous to the attack was a strong and very healthy man, twenty-three years of age—perfectly conscious, with a slight œdematous swelling of the face. On examination of the chest a dull sound over about an inch and a half of the lowest part of the lower lobe of the left lung was produced by percussion; crepitating rattles were audible, but there was no bronchial breathing, thus showing the beginning of resolution of the pneumonia; at the lowest part emitting the dull sound there was a slight pleuritic rubbing. The pulse was 140, respirations 41, and the temperature of the body 39° centigrade.

"The symptoms of the disease had commenced on the 16th of October with loss of appetite and diarrhœa, followed by a sensation of painful weakness in the limbs and difficulty in moving the tongue; the pulse being above 100. The patient was not confined to his bed during the day-time until the 6th of November, when the pneumonic symptoms commenced.

"The day after my arrival (Nov. 11th) the pneumonic symptoms were unaltered, with the exception of the pleuritic rubbing, which had moved a little higher up. The whole of the pleuro-pneumonic affection was so very trifling that it certainly did not account for a pulse of from 140 to 150, and for the violent oppression, or rather, as the patient explained it himself, 'the weakness in drawing his breath.'

"The following day the frequency of respiration varied between 30 and 60; the pulse was more than 200, and very weak; the temperature had fallen to 36°6′ centigrade, and the body was covered with a profuse clammy perspiration. The other physical symptoms were the same as before, and the pleuritis had not extended higher. The complaint of weakness in breathing, or, as the patient called it, 'the impossibility of drawing a sufficient quantity of air into the lungs,' was increased; but he remained conscious and resigned, so much so that he several times asked me at what hour I expected he would die.

"At seven o'clock on the evening of the 12th of November he died.

"The *post-mortem* examination, performed on the 13th, proved an infiltration of a part of the lower lobe of the left lung, extending upwards about an inch and a half from the lower margin of the lung, and about three or four ounces of liquid exudation in the pleural cavity of the same side. When examining the chest and intercostal muscles, I found, in every small piece of the muscle placed under the microscope, trichinæ partly wound up, but not capsulated, partly forming a single sling, and partly extended. In the examined parts of the heart and diaphragm no trichinæ were discovered.

"On the day previous to the above-mentioned post-mortem examination, I examined with the microscope several small pieces of muscles which had been taken from the bodies of persons who had died of the disease, and were given to me by the physician of Hettstadt, Dr. Rupprecht, and I found a considerable number of trichinæ in them.

"Previous to my departure from Hettstadt eighteen to twenty persons had died of the trichina disease, and more than eighty persons were at that period afflicted with the same malady, produced by the same cause.

"According to the information I obtained on the spot, the disease begins a few days after eating the meat in which there were trichinæ, with loss of appetite, and, almost without exception, with diarrhœa and fever, œdema of the eyelids, also pain, or at least painful sensation of weakness, in the limbs, œdema of the joints, difficulty in moving the tongue, profuse clammy perspiration; and those patients who do not become convalescent die either unconscious, with symptoms of typhus fever, or in a few cases remain conscious to the end, complaining of inability to breathe freely.

"The only important symptom of typhus absent in the disease is the enlargement of the spleen, and it is very probable that some of the so-called epidemics of typhus fever in former days were caused by the propagation of trichinæ in the human body.

"Since the disease has been known (about three years ago), a great many cases have been observed in Germany.

"The vitality of the trichinæ is not destroyed unless the meat or other substances in which they are located be subjected to the temperature of boiling water for a sufficient time to insure that every particle has been acted upon by that degree of heat. Salting and smoking trichinous meat, as is usually done, does not appear to be sufficient to destroy the worms in all parts of the meat.

"Picric acid (acidum picro nitricum) was tried, with the hope that it might be administered with success to the patient, but it failed.

"In trichinous pork of a pig killed with picric acid, the worms were found alive.

"HOMBERG, December, 1863."

A very interesting paper on intoxication from eating ham, was lately published by Dr. Tüngel, of Homberg, in Virchow's *Archiv*, vol. xxviii., hft. iii., iv., which seems to show most conclusively that it was caused by trichina spiralis. The number of persons affected by eating of the ham were nine, and their cases were subjected to a close medico-legal examination, partly by private physicians, partly in the city hospital; I will content myself with giving a short abstract of these cases. In the beginning of the month of June, 1851, a shade painter, in the immediate neighbourhood of Homberg, bought a ham at a lower price than usual, from a butcher whose business it was to furnish ships with hams. Those which he did not think sufficiently salted for use on board ships, he sold at a lower rate. This ham had nothing abnormal in appearance or taste, except that it appeared paler than usual. On examination on the 14th of July, after it had been interred since the 27th or 28th of June, it was in a putrid state in many places; but where still preserved, the surface of a fresh cut appeared of a normal red colour, infiltrated by fly eggs. A dog and a cat, which were fed on it, and kept six days under observation, showed no morbid symptoms. By chemical analysis no metallic poison could be discovered. The wife of the painter was first affected; she felt pain in her stomach a week before she was obliged to keep her bed; then the painter himself and his son were attacked. Of three persons who eat of it on the 25th, two showed symptoms of infection on the 27th, and one on the 29th. A young man, 21 years of age, of the neighbourhood, became sick three days after eating a small piece of it. Two daughters of the painter, the one six and the other eight years old, who had eaten very little of the ham, did not show distinct symptoms until three weeks afterwards.

The painter, his wife, and his son twelve years of age, his sister-in-law and two workmen, were all at first affected with vomiting and diarrhœa; a young man of the neighbourhood, and the two young daughters, who had only eaten very little of it, remained free from these symptoms, but all suffered from the most violent contraction of all the voluntary muscles and œdema.

The painter, his wife, and one of the workmen, died. The post-mortem of the two former gave no results, that of the latter was not performed.

The cat belonging to the family was also so violently affected that, after showing for a few days a pitiful appearance, it was killed.

It is now a matter of course that nearly all cases of intoxication from eating sausages arise from this cause. Dr. Kopp gives in his *Denkwürdigkeiten*, bd. iii. p. 75, a case of this kind, in which, besides the muscles of the larynx and of the neck, those of the eyes were also affected. In all these cases these symptoms did not appear until a fortnight after the consumption of the pernicious food.

*Prevention and Treatment.*—Prof. Leidy, of Philadelphia, was, I believe, the first who observed the trichina spiralis in the pig, the meat of which animal has been, so far as we know, always the cause of this dangerous disease. It ought always to be examined before being used as food, and in case it presents a suspicious appearance, it ought to be subjected to a microscopic examination.

A *thorough* boiling or roasting, as also intense salting and smoking, will kill the trichinæ, although an imperfect preparation by these methods will not affect these parasites, at least not those in the interior of the meat. Even putrefaction to a certain extent will leave the trichinæ intact. Therefore, as the first rule, suspicious or affected meat should never be eaten. If the character of the meat should be found out a short time after its consumption, the first remedy should be an effective emetic; but if the food has been ingested for five or six hours, and has entered the small intestines, a thorough purging with wormseed or other anthelmintic medicine ought to be resorted to, until the feces, examined under the microscope, are comparatively free of the parasites.

During the period that the disease raged in Plauen, Prof. Friedreich, of Heidelberg, had occasion to treat a case in a young man, a butcher by trade, who recovered after a few weeks. He thought, as picrate of potassa entered the system in a short time after its ingestion, as shown by the yellow colour of the conjunctiva and other structures, it would be advisable to give it in doses of five grains three times a day; but Dr. Fiedler, of Dresden, found, in his late experiments, that the animals infected by the parasite, were killed by the salt sooner than the trichinæ.

DARMSTADT, Dec. 28th, 1863.

[The trichina disease, treated of in the preceding interesting paper, is at the present time exciting great attention, and some further information in regard to it will, we conceive, be interesting to our readers. It is a febrile affection, resembling continued fever, caused by feeding upon pork infested by the trichina spiralis. That parasite, thus introduced into the intestines, propagates there largely, and migrates in vast numbers thence to the muscles, where they become encapsulated and prove a source of great disturbance to the economy.

Three disgusting and dangerous diseases in man thus owe their origin to the ingestion of the flesh of the pig, viz., tapeworm, hydatids, and trichina.

A very elaborate account of our present state of knowledge regarding the *trichina spiralis* has lately been communicated to the *Société de Biologie* by M. DAVAINE.

Passing by the first portion of his memoir, which is devoted to the history of the discovery of the parasite and a description of its characters, which have been fully detailed by Dr. Keller, we shall quote what he says in regard to the phenomena they give rise to, and which he has observed in numerous experiments instituted by him on various animals:—

"When trichinæ exist in great numbers, their presence in the muscles or intestines produces severe and sometimes fatal symptoms. These symptoms may, in animals experimented on, present three successive more or less distinct phases.

"The first phase is characterized by intestinal disorder, produced by the development of the larvæ in large numbers and their adhesion to the mucous membrane of the intestine. In this stage, M. Davaine has seen rabbits die with intense diarrhœa; one of two cats which he fed with trichinized meat had diarrhœa for at least a fortnight, but survived. Of five or six rats fed on a similar diet, one only, which was pregnant, died of diarrhœa, after abortion on the eighth day. According to M. Leuckart, the passage of the embryos of trichinæ through the intestinal walls sometimes produces peritonitis. This intestinal phase often becomes blended with the next; it may be relieved by the expulsion of the worms by means of the diarrhœa; or may cease with the natural death of the worms.

"The second stage presents general symptoms—muscular pains, etc. These phenomena are dependent on the introduction of the trichinæ into the muscles; they rapidly acquire their maximum intensity, and have not a long duration. The appearance and duration of this stage are in complete relation with the development and length of sojourn of the trichinæ in the intestines; in fact, in this entozoon oviposition is not slow and of long duration as in many nematoid worms; the genital tube is rapidly formed, and the ova in its whole length are developed almost simultaneously, so that the embryos, arriving soon at maturity, are at once thrown out in large number into the intestine, and the mother trichina dies exhausted. If it be remembered that the embryos do not escape before the eighth day, that a certain number of days are required for their arrival in the muscles, and that new ones are not produced after six or seven weeks, it will be understood that the first symptoms of this stage can scarcely appear until the end of a fortnight after ingestion of the diseased food, that they must continue four or five weeks, and that after this they may disappear. This course of events is observed in animals; and in man, the symptoms of this stage have shown themselves and become aggravated from the third to the sixth week after infection. Most animals die during this stage; rabbits rarely survive; rats, on the contrary, generally resist it.

"If the animals do not die of the general symptoms or local disturbances proper to these two stages, the inflammatory symptoms cease, respiration becomes natural, and order is re-established. But, in some cases, the number of cysts formed in the muscles are sufficiently great to impede the proper exercise of their functions, and hence arise general debility, a kind of consumption which persists or becomes aggravated, and the animal dies of marasmus. M. Davaine has noticed this in rabbits, but especially in a rat.

"Recovery from these phases of trichinal infection may be apparently perfect. A rabbit, which M. Davaine kept during five months, became large and fat, although it had a large number of trichinæ in its muscles; a rat which had had these entozoa in considerable numbers during six months was to all appearance in good health. Hence he concludes that the trichinæ produce symptoms only when they are in the intestinal canal and when they are entering the muscles.

Having become lodged in their cysts among the muscular fibres, they may remain harmless for an indefinite time. In every case except one, down to 1859, trichinæ have been found in the bodies of persons who have died of disease (generally chronic) or by accident, or in the dissecting-room in bodies regarding which the previous history could not be obtained. In most cases, the cysts contained a cretaceous or fatty deposit, showing that they had probably existed several years.

"The observations which have been made on the human subject in regard to the symptoms caused by trichinæ show that they belong, as in animals, to the initial period of infection. They consist in intestinal and muscular lesions; the latter coincide with the entrance of the parasite into the muscles, and are truly traumatic. In Zenker's case, the intestinal symptoms were swelling and pain; in a case described by Friedrich, diarrhœa was present. In all cases, the most remarkable symptoms were violent rheumatoid pains in the muscles, not in the joints, which were considerably aggravated by attempts to extend the half bent limbs. The other symptoms have been variable, but have had a strong resemblance to those of typhoid fever. In several cases there has been abundant sweating, and in one there was a very remarkable miliary and furuncular eruption. The animal heat was diminished in Friedrich's case; and in those observed in Voigtland by Freytag, the temperature never exceeded 102° Fahr.

"The progress, duration, and severity of the disease in man are in relation to the number of trichinæ taken into the digestive canal. Of sixteen patients observed at Plauen by Drs. Boehler and Kœnigsdœrffer, eight, who were moderately affected, recovered in a month; four, more severely diseased, were ill two months; of four others, one died with ascites and colliquative diarrhœa at the end of two months, and three recovered slowly at the end of three or four months. Recovery does not imply the death of the trichinæ; it follows their inclosure in cysts.

"The diagnosis of trichinal infection has several times been made in the living human subject by removing a portion of muscle. M. Davaine thinks it probable that, during the first six or eight weeks of the disease, the diagnosis may be confirmed by searching for adult trichinæ in the alvine evacuations, produced naturally or by means of a purgative."

*A very remarkable case of Trichinal Infection* is related (*Deutsche Klinik*) by Professor Langenbeck:—

While removing a cancroid growth from the neck of a patient arrived from the country, Dr. Langenbeck remarked that the platysma presented an unusual appearance. Microscopic examination showed that it contained an immense number of dead trichinæ, contained in calcified capsules. Inquiry was made as to the circumstances under which the immigration had probably occurred, and the following was the result: In 1845, a commission composed of eight persons went to a town in the district of Lansitz to inspect the schools. A collation composed of ham, sausages, cheese, roast veal, and white wine was served to the commission; only seven of the members partook of it, the eighth was absent at the time, and only took a glass of red wine at the dessert. Three or four days afterwards the seven who had partaken of refreshments were seized with intense diarrhœa, pain in the neck, and œdema of the face and extremities. In four the attack proved fatal; and the three others, including the individual on whom M. Langenbeck had operated, only recovered after a tedious illness. Rumours of poisoning spread about, as may readily be imagined. An investigation was ordered, but the result was negative; the public, however, did not so readily get quit of their suspicions, and the landlord of the hotel where the collation had been served soon found himself without customers, and was obliged to emigrate.

It is a question well worthy the attention of medical jurists whether many cases of death from suspected poisoning, in which no poisonous matter could be detected in the body, may not be due to trichina disease.

It is stated in the *American Medical Times*, Feb. 20th, 1864, that during the past week an instance of the poisoning of a whole family, and the death of one member, caused by eating a ham, occurred in the city of New York. The case was investigated by Dr. Schnetter, who found the ham full of the trichina spiralis, and did not hesitate to attribute the poisoning to this parasite.

In the summary of this Number will be found some further account of this disease.—EDITOR.]

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ART. VI.—*On the Major Amputations for Injuries in both Civil and Military Practice.* By JOHN A. LIDELL, M. D., Surg. U. S. Vols., in charge of Stanton Hospital, Washington, D. C.

AFTER nearly three years' experience in war, conducted on a very large scale—perhaps, indeed, the largest of modern times—the opinion of the military surgeons of this country is, I believe, unanimous in favour of primary amputation; provided, of course, that amputation be at all required. In this respect their views accord with those of nearly all surgeons who have practised with armies in modern times. Indeed, the experience gathered in each succeeding war has served to deepen the general conviction of the profession, with regard to the advantages of primary over secondary amputations, for wounds inflicted by the missiles of war. We think that John Hunter was widely mistaken when he wrote as follows: "It has been found that few did well who had their limbs cut off on the field of battle, while a much greater proportion have done well, in similar cases, who were allowed to go on till the first inflammation was over, and underwent amputation afterwards."[1] Contrariwise to this assertion of the superiority of secondary over primary operations, made by that great man, a very large number, wounded in the present war, have done well, who had their limbs cut off on the field of battle, while, on the other hand, a considerable number, wounded not so severely as those who underwent primary amputation,

[1] On this point Begin remarks: "This doctrine, which was that of Bilguer, of Faure, and of all the partisans of delayed amputation, has been successfully combated by the general experience of military surgeons. I would not have given it so much attention if, in the communications to which you have listened, there were not some tendency to extol it anew."—*Bulletin de l'Académie de Médecine*, t. xiv. p. 105, 1848.

Hennin also, speaking of the propriety of primary amputation, says: "The fact is established as firmly as any other in surgery; and, perhaps, in the whole range of the science, there is not one point where opinions have so little varied among English practitioners, from Wiseman downwards."—*Principles of Military Surgery*, p. 44, 3d ed., London, 1829.

have done badly, being allowed to go on till the first inflammation should be over; cases, too, that would have been likely to recover if amputation had been seasonably performed, both on account of the favourable character of the injury itself, and on account of the youth and constitutional vigour of the patient. All surgeons much experienced in the after-treatment of the wounded brought from the numerous battle fields of this war will, I doubt not, indorse the correctness of this statement. Furthermore, as having a bearing upon the subject under consideration, I can safely say, that I have never found a patient doing badly on account of having suffered a primary operation *per se*, while, on the other hand, I can with equal safety say that we have received from every battle, whose wounded have been sent to Stanton Hospital for after-treatment, some patients who were entirely past recovery at the time of reaching us, and that, too, because primary amputation had not been resorted to for them. I therefore firmly believe that many lives have been needlessly sacrificed during the course of this war for want of amputation seasonably performed, and that the medical officers serving with our armies in the field to-day are open to censure, as a body, not for operating too much, but for operating too little on the field of battle. A strong bias towards conservatism in surgery may lead some to misjudge with regard to the strength of the reparative powers of the system in a case of injury, and thus may induce them to make an attempt to save a limb, which does not meet with success, and too often, likewise, proves fatal to the patient. It is for this reason, that some military surgeons in high repute have recommended, that even in doubtful cases, primary amputation should always be practised;[1] and it now seems to me that a true conservatism in surgery—a conservatism which makes the preservation of the patient's life paramount to the preservation of a limb—fully sanctions the wisdom of this recommendation. I know well, that it does not accord with the modern ideas of conservatism, to condemn certain wounded limbs to be cut off without a trial to save them, and I am also fully aware how difficult it is to become persuaded of the necessity of such operation; but the unwilling conversion will surely be made, after witnessing the progress and termination of a number of these cases, wherein amputation was considered of doubtful propriety at the outset, and it will then as surely be realized, that this conversion has been effected at the expense of human life. (Vide *Macleod's Notes.*) It is probably on this account that, a war being continued through a number of years, the effects of a false conservatism become less manifest with the lapse of time, in the treatment of the class of the wounded now under consideration. This, indeed, is one of the surgical lessons which the history of every war has taught in

[1] Hennen says: "I am well convinced *the sum of human misery will be most materially lessened by permitting no ambiguous case to be submitted to the trial of preserving the limb.*"—*Principles of Military Surgery*, p. 114, London, 1829.
The Italics are in the original.

recent times; and we in this country, I fear, will be compelled to learn it over again, notwithstanding the pointed admonitions on the subject, given by the military surgeons who practised in the wars of the first Napoleon, and more recently by those who served in the Crimean campaigns.[1]

But, on the other hand, there is a numerous class of cases in which the principle directing the practice of our military surgeons does not appear to be obscured by any doubt. This generally accepted principle is, that if a limb be injured by a missile of war, or any other species of violence, in such a way that its preservation is *clearly* incompatible with the preservation of life, whether immediately or remotely in point of time, the operation of cutting it off should not be postponed; for, in such a case, every hour's delay will by so much diminish the patient's chance of recovery.

It may happen that, primary amputation having not been performed, when the period of inflammatory reaction has begun, the wounded parts will be invaded by an uncontrollable inflammation, which, extending rapidly to the whole limb, shall produce great swelling with a strong tendency to suppuration of a diffuse character, together with such a morbid state of all the tissues of the limb (diffuse cellulitis), associated with great constitutional disturbance and depression of the vital powers (irritative fever), that successful amputation can no longer be performed, and the patient must be left to die without effectual surgical interference; and that, too, because such interference has been unwisely postponed.

[1] At the meeting of the Academy, September 26, 1848, M. Begin said, towards the close of the discussion: "It is not the first time that military surgeons have been accused of amputating too freely; indeed, this impression is always produced by the first glance at their practice. All of them, however, have commenced by wishing to be conservative; but according as experience educates them, and as their observation extends, they amputate more, and have become convinced they are right in so doing. In reply to what has been said to the Academy by some of my distinguished colleagues, I will say, that at the outset of my career I amputated less than I did towards the close of my service as surgeon-in-chief of great establishments. There are certain cases, very often exaggerated, of wounded who pretend to have preserved limbs which the surgeon wished to remove; I have too frequently been present at the miserable death of subjects who refused the operation, or who, it was believed, might avoid it. The small number of the first, who boasted loudly, cannot compensate for the large number of the second, which caused me much sorrow. And again, how often are not these retained members a troublesome burden to those who carry them? Ask the surgeons of the Invalides if they are not each year solicited by some of these old soldiers, to relieve them of parts which are a burden to them, and which cause them inconvenience or incessant pain.

"I would think it a great misfortune if our military surgeons should allow themselves to be seduced by some of the assertions which you have heard. Such forgetfulness of the experience of their most illustrious predecessors would certainly entail the loss of many men which the art, practised with a more reasonable energy, might have saved."—*Bulletin de l'Académie de Médecine*, t. xiv. pp. 107, 108.

Such, indeed, is a brief account of what happened in the two following cases, which, therefore, afford good illustrations of the untoward consequences which may speedily follow delayed amputation.

CASE I. Private A. C., Co. K, 6th Maine Vols., a robust looking man, 21 years old, was admitted to Stanton Hospital Nov. 9, 1863. He had been wounded on the seventh, two days before, in battle at Rappahannock Station.

On examination it was found that the bullet (a conical one) entered the front of the left thigh about three inches above the upper margin of the patella, and passing backwards, fractured the femur in its lower third with much comminution, and lodged in the neighbourhood; the thigh was much swelled, the tumefaction extending nearly to the groin; the knee-joint was much distended by effusion, and very painful; he had great constitutional disturbance, a hot skin, frequent and feeble pulse, dry brown tongue, and was very restless; in short, he had all the symptoms of a low grade of irritative fever, with synovitis of the knee-joint, and widely diffused inflammation of the thigh. A water-dressing was applied; anodynes, alcoholic stimulants, and suitable nutriment were administered; and the limb was propped up with long sand-bags to keep it steady.

*Nov.* 10. He exhibited no improvement, and his condition remained but little changed till—

14*th.* Wound now discharging freely a thin, fetid, dark-coloured pus; swelling extended downwards to the leg; thigh greatly swollen, and darkred in colour; sordes on lips and teeth. On the following days he continued to grow worse, and on—

18*th.* The limb was attacked with gangrene; a number of large blebs, containing a dark-coloured serum, appeared on the thigh, and its surface generally presented a dark-brown mottled appearance; in the morning there was hemorrhage (non-arterial) from the wound, to the extent of one or two ounces, but it stopped without difficulty; he had subsultus tendinum and low muttering delirium; he continued to sink, and died Nov. 20.

The *autopsy* showed extensive comminution of the lower third of the femur, pus widely diffused among the muscles of the thigh, together with a large abscess behind the bone, containing the bullet, and communicating with the cavity of the inflamed joint.

This was a favourable case for primary amputation. The limb could have been removed, without difficulty, as low down as the last part of the middle third of the thigh, if operated on soon after the infliction of the wound. When he came to the hospital, however, although but two days had elapsed, it was too late for art to interfere in his behalf. Even if his general condition had warranted it, if typhoid symptoms of a grave character had not been present, the swelling and intense inflammatory action, which involved the thigh up to the groin, would have precluded the performance of successful amputation.

CASE II. Private J. R., Co. F, 5th Wisconsin Vols., a young man of 18, and of good constitution, was wounded in battle at Rappahannock Station, Nov. 7th, and brought to Stanton Hospital two days afterwards (Nov. 9th), having gunshot fracture of the left femur in its lower third.

The bullet (a conoidal one) passed through the limb from before backwards and somewhat inwards, about five inches above the knee-joint.

When admitted to hospital he was feverish, restless, and very feeble; the whole thigh, together with the knee, was greatly swelled and dark coloured; his pulse was very weak, and there was manifestly no prospect whatever of his recovery. Treatment: anodynes, free stimulation with alcoholics, along with beef-tea and any other nutriment he would take. He died on the morning of the 11th.

The *autopsy* showed that the swelling of the thigh was occasioned mainly by a serous infiltration, having an inflammatory origin, that even the muscular tissue was invaded by this infiltration, that the femur was broken in the lower third with much splintering, and that the end of one splinter was driven into the cavity of the knee-joint. He had succumbed before suppuration could be set up in the inflamed thigh.

This case illustrates still more strongly than the last the exceeding danger of delayed amputation, when the injury is of such a character as to demand that operation. The inflammatory action set up by thrusting a splinter of bone into the knee-joint and allowing it to remain there, and by pricking and piercing the muscles with sharp osseous fragments was so intense as to rapidly pervade not only the joint but also the subcutaneous with the inter-muscular cellular tissue, and even the muscles themselves throughout the thigh, as was shown at the autopsy. By amputation, seasonably performed, this thigh could have readily been removed in the middle third, and then the young man would have had a reasonable prospect of recovery.

The first advantage, then, of primary over secondary amputation, is that by the former procedure, a reasonable chance is afforded of saving the lives of a numerous class of the wounded, who would not survive till secondary amputation could be performed.

Again, if amputation be postponed from the primary to the secondary period, *purulent absorption* may occur in the meantime, and either put all operative proceedings out of the question, or render any operation unsuccessful that may be performed; and this, too, in cases which, if operated on primarily, would be likely to have a good result. This statement is intended to apply only to such instances of wounds as are not likely to recover without the excision of the injured member. Other cases do not come within its scope; and the cutting off of wounded limbs in general is not recommended as a precautionary measure against purulent infection, *per se;* but the fact is fully recognized, that when a limb is so injured that its preservation is incompatible with the preservation of life, there is great risk of the development of pyæmia from it. On this account it is that patients are more likely to recover by the primary than the secondary operation.

The following is a case in point:—

CASE III. Private J. S. S., Co. K, 2d New Jersey Vols., was wounded at the battle of Chancellorville, May 2d, 1863, by a musket-shot (conical), which, entering the outer side of the sole of the left foot, passed through

the said foot in a direction inwards and a little upwards, fracturing the tarsus; thence it continued its course to the right, impinging against the right ankle, shattering the lower end of the tibia and opening the ankle-joint; thence it passed upwards behind the muscles of the calf, where it lodged.

He was brought to Stanton Hospital six days afterwards.

*May* 8. At this time the joint (right ankle) was inflamed and considerably swelled; bullet not extracted; general condition not unfavourable; the ice dressing was applied to the wounds. So long a time had elapsed since the infliction of the wounds, that we determined to follow the course of events still further, and not to amputate, if possible, till, in the words of John Hunter, "all circumstances favoured the operation."

He went on without much change in his condition till—

15*th*. When he had a chill, and an abscess was noticed to be forming in the calf. Prescribed quiniæ sulph. gr. v, pulv. opii gr. j, every six hours.

16*th*. Inflammation and swelling extending up the leg from the ankle; had moderate coustitutional disturbance; countenance slightly tinged sallow; determined to amputate immediately; accordingly the leg was removed at the place of election by the posterior flap operation; patient under the influence of sulphuric ether; he did not rally well from the shock of operation. That night he exhibited great nervous agitation, with a feeble and irritable pulse, for which stimulants and anodynes were administered.

17*th*. Had passed a restless night; nervous agitation continued; in the afternoon he had another chill, followed by fever, sweats, and great prostration. Administered tinct. ferri muriat., quiniæ sulph. and alcoholic stimulants.

18*th* and 19*th*. Had rigors, fever, and sweats, at irregular intervals; his skin and conjunctiva presented a yellow appearance; had some delirium.

20*th*. He gradually sank and died of pyæmia.

The termination of this case showed that purulent infection, denoted by rigors, sweats, debility, and a sallow tinge of the complexion, had actually made its appearance before the operation was performed. At that time we hoped that the chill, which had taken place on the day before the amputation (May 15th), was malarial in character, but the sallow tinge of the countenance, even then, led me to suspect what afterwards happened. Still, under the circumstances, there was but little to be done unless amputation should be performed. Even on the supposition that pyæmia had commenced it was worth while to ascertain, by experiment, whether the disease could be arrested by the removal of the suppurating limb.

This case shows further, that secondary operations also should not be unnecessarily delayed, for such delay exposes the patient to increased peril from intercurrent disorders. And, indeed, the remark may here be made that the surgeon will never be sorry for the non-postponement of any necessary operation, other things being equal. It is possible, that if we had operated on this patient soon after his admission to the hospital, his life might have been saved; but at the same time it is certain, that if the same operation had been performed before the wounds had become inflamed, the accomplishment of such a result would have been highly probable.

A *second advantage*, therefore, of *primary* over *secondary amputation* is, that it lessens the danger of the intercurrence of purulent absorption, which, *per se*, would prevent the performance of any operation. Furthermore, cases allowed to go on to the secondary period are in constant peril from purulent absorption all this while, and subsequent to the amputation they are in at least as much danger from this cause as those undergoing the primary operation, so that from this point of view, also, the advantage rests with primary amputation.

CASE IV. F. H., Co. G, 14th Indiana Vols., aged about 35, and of robust make, was brought to Stanton Hospital, Dec. 26, 1862, along with many other cases of severe wounds, inflicted at the battle of Fredericksburg, Dec. 13, 1862. He had been struck in the right knee by a minié ball, which opened the joint very freely, and shattered the lower end of the femur extensively, breaking also the upper end of the patella.

When admitted to hospital his countenance was pale, his pulse feeble, he evidently was much debilitated, and complained of a great deal of pain in the injured parts, which were swollen and inflamed. The broken end of the femur protruded through the wound. This had probably occurred from carelesness in the transportation to hospital. Pus flowed freely from the wound. On introducing the finger, extensive comminution was detected, and we wondered that primary amputation had not been performed, as the preservation of such a limb must have appeared improbable from the outset.

The next day, Saturday, Dec. 27, two weeks after the injury, the thigh was amputated at the lower third, by the flap method, the patient being etherized. He lost but little blood, and bore the operation well.

*Dec.* 28. Patient feeble, but his case looks as favourable as can be expected. Treatment, free stimulation and beef-tea.

29*th*. Patient's condition continues rather favourable.

30*th*. Patient sinking in spite of stimulants and supporting treatment generally.

31*st*. Died of exhaustion.

Primary amputation was clearly indicated in this case. The operation could have been performed without difficulty, in the lower third of the thigh, with a good prospect of recovery, for he was more vigorous, in point of constitution, than the average of soldiers. On the other hand, the conservative method of treatment offered but a small chance for a successful issue; for, taking even the most favourable view of the case, the fragments of the broken condyles of the femur could have been cast off only after tedious and profuse suppuration, which would have destroyed the patient by exhaustion, if pyæmia should not intervene to bring the scene of suffering to a speedier close. Moreover, when it became necessary to convey the patient to a general hospital, if amputation had been previously performed, the lower end of the broken femur could not have been thrust down past its shattered condyles, and through the wound at the knee, from the accidents of transportation or from other causes. This, alone, is a circumstance of great importance to a case of this or any similar

kind of injury, for, while the patient's safety is promoted, he is also enabled to reach a general hospital in comparative comfort.

Again, the term *primary* is restricted to operations performed before the commencement of inflammation of the injured parts, and the term *secondary* to operations performed after these parts have become inflamed. The term *intermediate* also is sometimes employed. It refers to operations performed after the accession of inflammation and before suppuration is established. The distinction upon which it is founded, however, appears to be not essential in character, and therefore is of no practical importance, and, on this account, we shall continue to employ only the terms *primary* and *secondary*.

Now, it is apparent at a glance that a limb can be amputated at a place more remote from the trunk, before the wounded parts have become inflamed, than afterwards. And this is a matter of importance, because observation has abundantly shown, that the more remotely from the body a limb is cut off, the greater is the likelihood of a favourable issue. Furthermore, after a wounded limb has become inflamed, it may become necessary to go above the next articulation in order to amputate; whereas, if the operation had been performed before inflammation set in, the articulation might have been saved. Thus, in gunshot fracture of the leg with much comminution and opening the ankle-joint, amputation can nearly always be performed below the knee if done soon after the infliction of the injury, but if the operation be postponed till after the leg has become inflamed, then it may become necessary to go above the knee and amputate the thigh, and in this way, by delaying the operation, the patient loses not only a valuable articulation, but has his life exposed to additional peril; for all experience has shown that amputation of the thigh, especially for injury, is much more fatal than amputation of the leg.

For this important class of injuries, then, the primary operation obviously presents very great advantages over the secondary one, and the following case illustrates this view:—

CASE V. Lieut. C. H. D., Co. K, 26th Wisconsin Vols., aged 20, and of naturally fine physique, was wounded at the battle of Chancellorville, May 2, 1863, by a musket ball (conoidal), which penetrated the left leg about four inches above the internal malleolus, fractured the tibia, and, passing downward, fractured the astragalus and calcaneum, emerging finally through the sole of the foot. He was treated in the field hospital for some time, but when the army moved he was brought to Stanton Hospital, June 15, 1863.

The foot and leg were then much swelled, the tumefaction extending up to the knee; the ankle joint was open, and the wounds were suppurating freely. He was also thin and pale. The water dressing was applied, and a nutritious diet ordered.

*June* 18. He was attacked with fever ushered in by a chill.

19*th*. The fever continued.

20*th*. The foot and ankle are greatly swelled; the skin presents an ery-

sipelatous blush; the superficial lymphatics of the leg and thigh are inflamed; they feel like hard cords, and the skin over them is streaked dark red in colour nearly to the groin; free incisions were made in the foot to relieve tension; cold applications to the leg and thigh.

21*st*. The lymphatic ganglia of the groin were swelled and painful. Prescribed ungt. hydrarg. et camphor.

24*th*. The inflammation of the lymphatics had subsided, and he was much better in every respect.

26*th*. The swelling of the foot and leg again increased, and

27*th*. The thigh was amputated at the lower third by the circular method, the leg being so much swelled and inflamed that the operation could not be performed below the knee. There was troublesome oozing of blood from the surface of the stump, which was controlled by the application of persulphate of iron. The stump was left open to granulate from the bottom and to prevent any accumulation of pus, and he slowly recovered.

In the case of this officer, if the primary operation had been employed, the leg could have been cut off at or near its lower third; the result would almost certainly have been favourable, for the fatality of amputations performed at that place in young and healthy subjects is very small, especially with the superior after-care which an officer is able to command; he would have saved his knee-joint, which, by the way, is one of the most useful in the whole body, invaluable, we might say, for using an artificial limb; he would have escaped the terrible peril to which his life was for a long time exposed from purulent absorption; and he would also have escaped a confinement to bed which lasted for many months.

Guthrie says:—

"When an amputation is deferred to the secondary period, a joint is often lost. A leg which might have been cut off below the knee, in the first instance, is frequently obliged to be removed above the knee, when done in the second." —*Commentaries on Military Surgery*, p. 59.

Again, *primary amputation is more advantageous than secondary amputation, because the mortality following it is very considerably less than that following secondary amputation.* This has been the chief reason why in time past military surgeons have almost uniformly preferred the primary to the secondary operation, in the treatment of the casualties of war. A marked difference in the ratio of mortality between the primary and the secondary method, and in favour of the former, has been observed in different wars, in different countries, and in different climates. Thus, according to MACLEOD, the mortality in the British army in the Crimea was, for primary amputations, 37 per cent.; for secondary amputations, 60 per cent.; in the British Naval Brigade 31 per cent. for primary, and 50 per cent. for secondary operations. Among the French at Constantinople 32 per cent. for primary amputations, and 41 per cent. for secondary ones. At Toulouse, in 1814, 20.8 per cent. for primary, and 43 per cent. for secondary operations. Among the British at New Orleans, in 1815, 15.5 per cent. for primary, and 71.4 per cent. for secondary amputations; and after Waterloo

41.4 per cent. for primary, and 57.7 per cent. for secondary operations. The table of major amputations for gunshot wounds compiled by MACLEOD after excluding from it all extravagant data, exhibits an aggregate of 1047 cases of primary amputation and 374 deaths, being a mortality of 35.7 per cent.; also an aggregate of 594 cases of secondary amputation and 314 deaths, being a mortality of 52.8 per cent.

According to Baudens, in 345 primary amputations treated at the Hospital Guhlènè during the Crimean war, there were 137 deaths, which gives as a ratio of mortality 39.7 per cent.; and in 149 secondary operations performed at the same hospital there were 77 deaths, which gives as a ratio of mortality 51.6 per cent.

It is also stated that the Russians lost one-third of their primary amputations, and two-thirds of their secondary ones, in the Crimean war.

There have been treated at the Stanton Hospital, Washington, D. C., under my direction, 61 cases of primary amputation, of which 18 died, giving as a ratio of mortality 29.5 per cent. Of these 61 amputations, 18 were of the thigh, with ten deaths, the ratio of mortality being 55.5 per cent.; 25 were of the leg, with four deaths, and a ratio of mortality of 16 per cent.; 2 were at the knee, of which one died, the ratio of mortality being 50 per cent.; 12 were of the arm, with three deaths, and a mortality of 25 per cent.; 2 were of the forearm, of which neither died; 1 at the ankle-joint, and one through the tarsus, both of which were successful. Total, 61 cases and 18 deaths; ratio of mortality 29.5 per cent.

At the same hospital 12 secondary amputations have been performed, of which 6 proved fatal, giving a mortality of 50 per cent. Of these operations 7 were through the thigh, with 3 deaths, and a ratio of mortality of 42.8 per cent.; 4 were through the leg, with 2 deaths, and a ratio of 50 per cent.; 1 through the left arm and right forearm (double operation), which proved fatal, giving a ratio of mortality of 100 per cent. Total, 12 cases of secondary operation, and six deaths; ratio of mortality 50 per cent.

It will thus be seen that our experience agrees, in the main, with that of military surgeons of other times and at other places, and that here, as well as elsewhere, the fatality of the greater amputations, taken together, is considerably less when performed primarily than when performed secondarily for the casualties of war.

Among civil surgeons, however, the question of the relative superiority of primary over secondary operations appears to be still unsettled. They appear to entertain some doubt, with regard to the comparative mortality of primary and secondary amputations, performed for the injuries met with in civil practice. The opinion of the profession on this subject seems never to have settled down into a fixed belief. Some have been inclined to think that primary operations are more fatal than secondary ones in civil life. Mr. Erichsen says, that "in civil practice the mortality after primary

amputations somewhat exceeds that following secondary operations."[1] In another place he asks, "To what is this difference between the results of primary and secondary amputations in civil and military practice owing? Why are the results of amputation reversed in civil and military practice? Why are primary amputations more fatal in civil, and secondary in military practice?"[2] He then proceeds to answer the question, by attributing the difference to a deficiency in moral stamina on the part of the civilian, as compared with the soldier, to withstand the shock of the injury. This answer appears to me unsatisfactory, for, admitting the superiority of the soldier in point of morale, there is, on the other hand, a superiority on the part of the civilian in point of physical condition at the time of injury. He is not broken down with the hardships, nor worn out with the long marches, nor badly nourished with the unvaried, and sometimes scanty diet, incident to an active campaign in the field. He is not exhausted with the labours and vigils which the soldier is compelled to undergo in the trenches during the progress of a siege. In these respects the injured civilian has a great advantage over the wounded soldier, enough, I am inclined to believe, to fully counterbalance the deficient morale. I can see no reason, therefore, why the results of this class of operations should differ materially in civil and in military practice; and, if I read civil statistics aright, the results are essentially the same in both civil and military practice.

If we examine closely the statistics to which Mr. Erichsen refers in the paragraph heretofore quoted,[3] we shall find that of the twenty-seven primary amputations performed in University College Hospital only eight died, which gives as a ratio of mortality 29.6 per cent., and that of twenty-six cases of secondary amputation eleven died, which affords as a ratio of mortality 42.3 per cent. These results do not differ much from those of similar operations occurring in the British Naval Brigade, as reported by Macleod, viz.: 31 per cent. for primary, and 50 per cent. for secondary operations.

Again, if we take the cases of amputation for injury occurring in the practice of various surgeons, as tabulated by Mr. Erichsen, and add them all together, we shall obtain a total of 382 cases of primary amputation with 132 deaths, which gives a mortality of 34.5 per cent.; we shall also obtain a total of 126 cases of secondary amputation with 71 deaths, and a ratio of mortality of 56.3 per cent. These results present a striking similarity to those furnished by the aggregates in Macleod's table, "showing the mortality following the greater amputations in all parts for gunshot wounds,"[4] viz: 35.7 per cent. for primary, and 52.8 per cent. for secondary amputations, as already quoted in this paper.

[1] Erichsen's Surgery, p. 45, American edition, 1860. [2] Op. cit., p. 46.
[3] Erichsen's Surgery, pp. 45 and 46, American edition, 1860.
[4] Notes on the Surgery of the Crimean War, p. 366, American edition, 1862.

The reader will observe that these results are afforded by an examination of the tables furnished by Mr. Erichsen himself. If now we turn to Macleod's table showing the mortality following the greater amputations for injuries occurring in civil life,[1] and embracing the results of practice in several civil hospitals, we shall find a total of 608 cases of primary amputation and 215 deaths, which affords as a ratio of mortality 35.3 per cent.; also a total of 224 cases of secondary amputation and 137 deaths, the ratio of mortality being 61 per cent. These results do not differ much from those furnished by Mr. Erichsen's tables and from those afforded by military practice.

If we turn to American statistics, we find additional proof that primary amputations are much less fatal than secondary ones in civil practice. Norris states[2] that, prior to 1850, 115 primary amputations were performed at the Pennsylvania Hospital, of which 27 died, giving as a ratio of mortality 23.4 per cent. He also states that during the same period 41 secondary amputations were performed at the same hospital, of which 16 died, giving as a ratio of mortality 39 per cent. These were all major operations.

Now, giving due weight to all these statistics, we cannot avoid the conclusion, I think, that primary amputations are much less fatal than secondary ones in civil as well as in military practice; and, furthermore, that the ratio of mortality for similar operations does not differ materially in civil and military practice.

I would not be so much inclined to criticize the statement of Mr. Erichsen, already quoted, if that statement was not likely to lead to erroneous practice, by inducing surgeons to delay to operate, in case of injury requiring amputation, from the primary to the secondary period, under the mistaken idea that the patient's chance of recovery would be improved by so doing.

In the preceding pages we have seen that primary amputations are more advantageous than secondary ones, because, in the *first place*, they afford a chance of recovery to a numerous class of persons suffering from gunshot wounds or other injuries, who would not survive the inflammatory stage together with its intercurrent disorders, until such time as the secondary amputation could be performed; and because, in the *second place*, primary operations are a great deal less fatal, *per se*, than secondary operations. Such being the facts, it follows as a necessary consequence, that the *proper time to amputate*, in all cases of wounds or injuries demanding that operation, is during the primary period, *i. e.*, previous to the commencement of inflammation in the wounded parts, or within a period of twenty-four or thirty-six hours after the infliction of the injury.

[1] Op. cit., p. 367.

[2] American Journal Medical Sciences, vol. xxviii., July, 1854. Statistics of Amputations at Pennsylvania Hospital.

Concerning *the time to operate*, it should also be stated, that in very many cases there is an interval of time, which, however, varies in length in different cases according to the severity of the injury and the constitution, temperament, etc., of the patient, that elapses between the infliction of the injury and the occurrence of that depression of the forces of the system which is denominated "shock." This interval preceding "shock" is present in nearly all cases of severe injury, except those wherein either sudden and profuse hemorrhage occurs, or the great nervous centres suffer from concussion at the same time. If, however, the original injury be complicated by profuse bleeding or with concussion, then the symptoms of "shock" are developed without delay. But it is pretty certainly true, that in a large majority of the cases injured in such a way as to demand amputation, the symptoms of "shock" do not come on immediately. If now amputation could always be performed in such cases in this interval between the infliction of the wound or other injury and the development of "shock," I have no doubt that the prospect of recovery would be greatly improved thereby, more especially if the patient should be under the influence of an anæsthetic while undergoing the operation; *for, by operating at this particular time, aided by ether or chloroform, the "shock" would be either entirely prevented or considerably moderated in severity.* The rationale of this obviation of "shock" through the intervention of art is probably as follows: the "shock" in these cases is the joint product of at least two elements which are entirely distinct from the concussion of the nervous centres or the loss of blood. These elements are, *first*, depression growing out of the sympathetic relations of the system at large with the laceration of the muscles and the nerves and the splintering of the bones with the sharp fragments driven, perhaps, into the surrounding soft parts, or even into a neighbouring joint; and *second*, depression growing out of the mental emotions, such as the horror of the mutilation occasioned by the injury itself, the terror at impending death, the dread of the operation, etc. Now, by cutting off the injured limb immediately and before the supervention of "shock," the tendency to the development of "shock" is diminished, *first*, by the fact that the torn and jagged wound of injury has been changed into the simple incised wound of operation; and, *second*, by administering an anæsthetic, the excited emotions are put to sleep, and when the patient wakens he finds that the dreaded operation has been performed; he believes himself comparatively safe from death, and the buoyancy of hope takes the place of the depression of despair. Immediate amputation would be likely to prove most serviceable in cases where the bleeding is excessive, or where the amount of injury and mutilation from injury happen to be great, for in such cases the amount of "shock" also is very great, and the principal danger is, that, after profound "shock" has once been established, the patient cannot be made to rally so as to undergo a successful operation afterwards. I therefore believe that *immediate* amputation ought to be

practised in all cases demanding the operation, which may come under the surgeon's eye prior to the development of "shock," more especially in cases where there is copious hemorrhage, or, again, in cases where a limb has been torn off by a cannon shot, or by the explosion of a shell, or in civil practice, crushed by a railway carriage, or torn off by any kind of machinery. Immediate amputation, for the most part, cannot be practised during a campaign in the field for obvious reasons, but the stationary condition of troops during sieges, and on shipboard in naval warfare, would afford many opportunities of employing it; and I believe it to be the duty of the medical officers serving in our fleets and with our troops conducting sieges on land, to make the needful preparations for performing as many *immediate* amputations in cases requiring that operation as possible.[1]

Again, the presence of slight or even a moderate amount of shock does not contraindicate immediate amputation; but if the shock be excessive, or even severe, then it is better to delay the operation until reaction has been fully established. In the mean time reaction should be promoted by the application of dry heat externally, and by the administration of such stimulants internally as are adapted to the degree of the shock, employing the most powerful of the diffusible stimulants, such as brandy and carbonate of ammonia, freely in the desperate cases, and the same stimulants in smaller quantity, or perhaps only wine, or even warm tea or coffee in cases of a less severe character. As soon as the reaction has been fully established, amputation should be performed without further delay, because the injured part will speedily become inflamed, and such a condition of the limb may quickly supervene as to preclude a successful operation. I have met some military surgeons of large experience in operating, who do not hesitate to amputate even while the system is a good deal depressed by

[1] Macleod says: "Whatever that condition is which is conventionally known as 'shock,' it seems pretty evident from the admission of all, that it is not established for some little time after the receipt of an injury—an interval which differs in duration mainly in accordance with the severity of the wound, the agency by which the injury has been caused, and probably the constitution of the sufferer. The evidence of naval surgeons, as summed up by Mr. Hutcheson, in reference to the absence of shock immediately after the receipt of a wound, must be conclusive to all unprejudiced minds; and instances were not wanting during the late war which appeared to support the same view. I know of several well-authenticated cases which occurred during the siege, in which the perfect absence of all constitutional prostration after an accident so severe as the carrying off of a limb, and the non-appearance of such shock for some considerable time after, went to prove the same position. If this precious moment could be seized at all times, and that operation performed under chloroform, which assists so much in warding off the 'embranlement' we fear, how much more successful would our results prove than under any other circumstances they ever can be."—*Notes on Surgery of the Crimean War*, p. 322, American edition, 1862.

"shock," and they entertain the belief that the patient is benefited by so doing.

These remarks are not in any way applicable to amputations performed in civil practice for disease, but to operations resulting from injuries alone, whether they occur in military or in civil life. The statement should, however, be made, before leaving the subject, that the ratio of mortality differs very much between amputations undertaken on account of disease and on account of injury; for experience and statistics concur in showing that the fatality of amputation is far less in corresponding limbs after disease than after injury. This fact is well illustrated by the record of the greater amputations of all kinds performed at University College Hospital, which has been published by Mr. Erichsen, and to which reference has already been made. That tabular statement shows, that amputations performed for injury are about twice as fatal as those performed for disease. Thus, while there were 53 amputations performed for injury, including of course both primary and secondary operations, of which 19 proved fatal, giving as a ratio of mortality 35.8 per cent., there were 121 amputations for disease, of which but 22 proved fatal, giving as a ratio of mortality only 18 per cent.

The tenor of American statistics is still more emphatic in respect to the comparative fatality of similar amputations undertaken for injury and for disease. I find 316 amputations for injury reported by Norris[1] as having been performed in the Pennsylvania, the New York, and the Massachusetts General Hospital, of which 106 died, the ratio of fatality being 33.5 per cent. I also found 179 amputations for disease reported as having been performed in the same hospitals, of which only 28 died, the ratio of fatality being only 15.6 per cent. According to this statement amputation for injury is rather more than twice as fatal as amputation for disease.

We see here the probable reason why civil surgeons have insensibly been led to consider the results of secondary amputations to be much more favourable than those of primary ones, commingling unconsciously their impressions of the very favourable results of operations performed for disease with those pertaining to secondary operations proper. It is scarcely necessary to intimate, after what has already been said, that these impressions, however honestly entertained, are entirely erroneous with regard to secondary amputations, while strictly true with regard to amputations for disease.

Why are amputations for disease so much less fatal than those undertaken for injuries? This is one of the most interesting questions which can be presented to the surgical pathologist. In seeking for a solution, it must be borne in mind that the morbid states, on account of which the remedy of last resort for preserving life is employed, are widely different,

[1] American Journal Med. Sciences, vol. xxviii., July, 1854.

I may say scarcely similar in the two cases. Thus, the *diseases* which require amputation belong, for the most part, to the bones and joints, and nearly all of them are exceedingly chronic in character. The patient has suffered for many months, and oftentimes for many years, before the progress of the disease has rendered the operation indispensable. In the mean time, his whole system has gradually become accustomed to the presence of the disease, and the reparative processes have been constantly busy in circumscribing it as much as possible, and combating its fatal tendencies. Now, if we remove the whole seat of the difficulty at once by amputation, nature accepts the deed as a precious boon. The system rallies, and a rapid convalescence immediately commences. It is in such cases that we most frequently get union by the first intention.

On the other hand, everything pertaining to amputations for injuries is in most cases exceedingly acute in character. But little time, as compared with operations for disease, elapses between the infliction of the injury and the performance of the operation which it has made necessary. There is also a depressed condition of the forces of the system, a result of the injury itself, called "shock," very frequently, indeed almost always, present. Now, "shock" alone is a not uncommon cause of death after primary amputation, and an occasional one after secondary amputation. But the mischievous effects of "shock" do not end here. Even in those who appear to rally well from the operation, the vicious effects of "shock," with its rude disturbance of the vital powers, and its consequent disturbance of the reparative forces of the system, are too often visible for some time afterwards, in the production of *sloughing of the stump, of osteitis with necrosis, of osteo-myelitis with pus in the medullary canal of the bone in the stump, and finally in the production of purulent infection and inflammation of the veins, also thrombosis, embolism, and metastatic abscesses, with the distressing train of fatal symptoms which represent pyæmia.* These are the accidents which happen most frequently to cases of amputation performed for injury; and the connection between them and the "shock" must not be overlooked. This intimate relation probably explains, in part at least, the great value of free stimulation by alcoholics, and the supporting treatment generally in the management of severe wounds and severe injuries, together with the operations rendered necessary by such wounds or injuries.

When, however, an injured limb is amputated a long time subsequent to the infliction of the injury, it will often be found that the operation has lost its *traumatic* character, and that it assimilates in point of safety and in most other respects to corresponding amputations performed for disease. The following case affords a good illustration of the correctness of this statement:—

CASE VI.—Private Frank Mullen, Co. E, 43d N. Y. Vols., aged 21 years, and of sound constitution, was wounded in battle at Fredericksburg,

Va., May 3d, 1863, by a musket ball (conoidic), which fractured both bones of the left leg at the lower third while passing through.

He was brought to Stanton Hospital three days afterwards, May 6th. His general condition was good, and it was judged expedient to attempt to save the limb without operation. Accordingly it was placed in Hodgen's splint and the water dressing was applied.

*May* 9. Wounds suppurating freely.

*June* 1. Wounds discharging a good healthy pus; appetite good; pulse normal; consolidation taking place.

*Aug* 1. The parts continued to heal nicely up to July 28th, when he fell while attempting to walk across the ward, and refractured the limb.

2*d*. Removed several pieces of bone.

15*th*. Parts œdematous; discharge thin and fetid.

19*th*. A small necrosed splinter came away; suffering in general health.

*Sept*. 1. Condition of leg about the same.

*Oct*. 1. Improvement both general and local; discharge thicker and healthier in character; removed the splint.

*Nov*. 1. Extensive necrosis of shaft of tibia; the dead bone is encased completely in an involucrum; condition fair; discharges from several openings.

*Dec*. 1. But slight change from last month.

*Jan'y* 1, 1864. Involucrum large; skin covering the front of it thin, and about to ulcerate extensively; foot considerably twisted inwards by abnormal muscular action (partial talipes varus), and the deformity steadily increasing; ankle-joint also becoming stiff. There being no now hope of preserving a useful limb, it was deemed advisable to remove it by amputation.

9*th*. The leg was amputated at the junction of the upper with the middle third, by the flap method (double flap, anterior one short); the sawn end of the tibia was levelled off, as recommended by Sanson; that is, "by placing the saw obliquely, not on the ridge, but on the internal surface of the bone."[1] The fibula was divided somewhat higher up than the tibia, as practised by Roux. Throughout the operation the patient was insensible from sulphuric ether. He did not exhibit any perceptible shock. The flaps were carefully coapted, and secured by several points of interrupted suture and strips of isinglass plaster. Several turns of a roller were placed round the leg to serve as a supporting bandage, but no other dressing was applied.

10*th*. Patient sitting up in bed reading a newspaper; stump in fine condition, being free from heat and redness, and almost devoid of pain and swelling.

13*th*. Dressed stump for the first time and removed the sutures; found it to be uniting by primary adhesion; no constitutional disturbance whatever.

24*th*. The last ligature came away; patient has not at any time, nor in any way, suffered in consequence of the amputation. The stump united by the first intention. In short, he recovered precisely in the same way as the most fortunate cases of amputation of the leg, on account of disease, get well.

The division of the tibia by the method of Sanson appears to me to possess practical advantages of so much importance, that it ought to be generally adopted, especially in military practice.

These advantages are, first, that it obviates the inconvenience occasioned

[1] Stephen Smith's Handbook of Surgical Operations, p. 151.

by the muscles retracting above the sawn end of the tibia. Malgaigne says: "Whatever be the proceeding preferred for the section of the soft parts, some modification must be added in sawing the bone; for, if you saw off the bone on a level with the muscles, their retraction will leave it projecting." Now, in such a case, when we come to bring the soft parts into apposition for the purpose of dressing the stump, it will be found that they are drawn across the sharp edges and sharp angles of the projecting bone. But if the tibia be divided obliquely, commencing the section on its internal flat surface, and terminating it at its external sharp border to which the interosseous membrane is attached, as recommended by Sanson, this inconvenience will be remedied to a very great extent; for the anterior sharp angle will be removed, and the inner sharp edge will be replaced by an inclined surface of sawn bone. Another advantage afforded by this procedure is, that the risk of exfoliation appears to be considerably diminished thereby, for the periosteum remains covered by the soft parts nearly down to the end of the divided bone.

All surgeons much experienced in the after-treatment of amputations of the leg will, I feel confident, recognize the practical value of the advantages claimed for this method of Sanson for dividing the tibia in such cases.

The principal object of this paper has been to show clearly the proper time to operate for traumatic lesions, in both civil and military practice, and I cannot conclude it better than in the words of Mr. Guthrie:—

"The advantageous results of *primary* amputations, or those done within the first twenty-four or at most forty-eight hours, over *secondary* amputations, or those done at the end of several days, or three or four weeks, have been so firmly and fully established as no longer to admit of dispute."—*Commentaries on Military Surgery*, p. 59.

The author proposes to discuss hereafter the special lesions of a traumatic character which demand amputation; also those for which resection should be practised, together with those cases of gunshot fracture, and wounds of joints, the cure of which should be attempted without operation. The foregoing paper is, in reality, introductory to the subject of amputation for injury.

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ART. VII.—*Report of Cases of Hospital Gangrene treated in Douglas Hospital*, Washington, D. C. By WILLIAM THOMSON, M. D., Asst. Surg. U. S. A.

THE following histories of cases of hospital gangrene treated in Douglas Hospital, Washington, serve to illustrate several points of great interest in the etiology, pathology, and treatment of a disease hitherto rare in our military hospitals, and most worthy of careful study.

The victims of this disease were wounded at Fredericksburg, Va., Dec. 13th, 1862. For several weeks previous to this battle, the army had been resting on the Rappahannock, and had been exposed to no great hardships. It had been amply supplied with good and varied food, and the men were free from any scorbutic or other cachectic taint.

It is well known that the fullest preparations had been made by Surgeon Letterman for that engagement. The operations were performed promptly, and the wounded probably received better care than ever before in the history of the war.

On the 26th of December, 1862, about two hundred wounded from the battle of Fredericksburg, were received into the Douglas Hospital.

I cannot speak of their treatment, medical, surgical, or hygienic, as at that time I was not connected with the hospital. I am, however, aware that the building in which the gangrene appeared contained fifty badly wounded, and recent cases; that there was a deficiency of medical officers and dressers to insure the necessary cleanliness, and that the sanitary condition of the ward was far from perfect.

This hospital consists of the three brick houses known as "Minnesota Row;" and two large wooden pavilions, each divided into two wards.

The ward in which this disease originated is one hundred and forty-three feet in length, twenty-three feet in breadth, and sixteen feet in height (eighteen feet at the cone, and fourteen at the eaves of the roof), and contains beds for fifty patients, thus giving 1050 cubic feet of space for each bed. There are two rows of windows, the lower of which contains two, the upper one sash each; the upper windows so constructed as to be opened by means of a cord, but when opened directing a current of cold air immediately downwards upon the beds beneath.

On the 16th of Feb. 1863, I took charge of the hospital, and found the ward mentioned in the following condition: There was no ridge ventilation, nor was there any egress for foul air, except through two large wooden shafts connected with two of the stoves, which had been placed there only a few days previously. The ward was heated by ordinary sheet-iron radiating coal stoves; and no provision had been made, until a few days before, to introduce any supply of fresh air. It contained from forty to fifty patients, all wounded—many of them very severely. The police was not unexceptionable, too little attention having been paid to the removal of offensive discharges. The medical officer in charge preferred to water, as a dressing, either simple cerate or mutton tallow, which had been issued to the hospital, and which had become rancid. The attendants were, from a want of strict discipline, careless and inattentive. There was a perceptible and offensive odour in the ward, which felt close and badly ventilated; and this condition of the atmosphere seemed to have a marked effect on the spirits of the men; they were all gloomy, despondent, and homesick.

On Feb. 17th, when making my first visit with the officer in charge of the ward, I discovered

CASE I. Sergt. Otto Kosack, Co. K, 2d Md. Vols., who had been struck by a shell, Dec. 13th, 1862, which made it necessary to amputate his left leg at the middle. The operation was done ten minutes after the injury. He was received here on the 26th Dec. The stump closed by granulation, a small portion of the tibia having been removed by exfoliation. The cicatrization had been almost complete, when, a few days previous to the 17th, the still open wound commenced to slough. He was anæmic, very pallid, haggard, and with an expression of great depression in his features; his pulse was very feeble and rapid. He had been "feeling very badly" for several days, and complained of a burning pain in the stump.

On the outer side of the tibia there was an ulcer, one inch in diameter, covered with a yellowish-gray, pultaceous slough, and a serous and very fetid discharge; the edges were thickened and everted, and an areola of purple, livid congestion, extended for half an inch from the margin, which was undermined.

This sore was at once treated with pure nitric acid, applied both to the ulcer and to the areola; the ulcer was dressed with an antiseptic solution of creasote; and citrate of iron and quinine, with stimulants and nutrients were freely given.

On the 18th the sloughing had extended to the border of yesterday's livid areola, but was now more superficial; and the areola, which had likewise invaded the surrounding skin, was more florid. The ulcer was now two inches in diameter. As there was some doubt as to its specific character, the patient was not removed from the ward until the 23d, when he was transferred, with several others, to a small ward prepared in the brick building, and completely isolated from the other wounded men.

The iron and quinine was found to disturb his stomach and destroy his appetite, and was replaced by a mixture of nitro-muriatic acid and tincture of opium.

*March* 3. The sore was now perfectly healthy, and was granulating rapidly.

This was a mild case—treated in its incipiency with nitric acid most thoroughly. The ulceration had not extended so deeply, nor so far beneath the margin of the skin, as to make it almost impossible to reach every portion of the diseased surface.

There was no scorbutus. The gums were firm and hard. The patient was very pallid, his heart feeble, and his pupils dilated. The mucous membranes were very pale, and the expression of the face haggard and anxious.

He recovered rapidly, with a good stump, and was transferred to St. Elizabeth Hospital, May 4th, to enable him to procure an artificial limb.

This man was seen several months after walking with great ease on his artificial leg.

CASE II. L. D. Thurston, private, Co. A, 16th Regiment New Hampshire Vols., aged 42, was struck by a fragment of shell on December 13th, 1862, at Fredericksburg, Va., which caused a severe but superficial wound of the integuments on the outer side of the left thigh.

When seen, Feb. 17th, 1863, there was a wound at the middle of the

thigh, on its outer aspect, three and a half inches long by two and a half wide, exposing the muscular tissue slightly, the surface of which was glazed and dry.

On the 10th of February it had been found desirable to open an abscess, three inches below the left greater trochanter. On the 13th, this had assumed an unhealthy look, and when I saw it on the 17th, the incision made by the lancet, half an inch in length, was surrounded by a border of sphacelus one inch in width, and by an areola of purple congestion, in which there seemed to have occurred a complete stasis of the circulation. There was no pus, but a discharge of very fetid, dark-coloured serum. There was no swelling, ulceration, or eversion of edges of the incision, which, although mortified, remained as sharp as when first made.

There was profound nervous prostration, which was indicated by his rapid, feeble, and irritable pulse; by his sallow hue; his haggard and anxious expression of countenance; his weary and helpless decubitus, and great mental despondency.

He was treated internally with stimulants, the most condensed and nourishing food, and citrate of iron and quinine; nitric acid was applied locally, followed by a weak solution of creasote, three drops to the ounce of water, as an antiseptic dressing.

The sphacelus extended in all directions rapidly, unchecked by this treatment, from which I hoped little, since it was impossible to bring the acid into contact with the diseased tissues, although it was injected into the incision. The constitutional symptoms, also, became more grave.

On the night of the 20th, there was quite a severe hemorrhage from the incision, oozing slowly and very difficult to restrain, since it was caused by the erosion of vessels at a distance from the small incision. There was now a circular patch of sphacelus surrounding this small incision, three inches in diameter.

On February 23d he was removed to the ward in the brick building. The original wound, hitherto unaffected, now began to be black and offensive. The sphacelus extended from these two centres, at the rate of one inch daily, preceded by the above-mentioned areola of purple stasis.

No treatment, local or constitutional, produced the least effect. Stimulants were given in every possible form, until the stomach refused to retain them. Pure nitric acid was freely applied to the diseased surfaces with no benefit. He fell into a typhoid condition, with muttering delirium, subsultus tendinum, etc., and finally expired February 28th.

The sphacelus then extended from the trochanter major to three inches above the outer condyle; and from the median line in front to a corresponding point behind. There had never been any ulceration, but the tissues seemed to perish *en masse*. The incision made by the lancet was yet plainly seen in the centre of an extensive surface of mortification. This man was 42 years old, had had chronic diarrhœa, and was in a feeble state of health when wounded.

No benefit was observed from any treatment. He took, in addition to the nutrients and tonics, the acid mixture with tincture of opium.

The preparation was forwarded to the Army Medical Museum.

CASE III. Private Samuel Fossett, Co. I, 12th Regiment Rhode Island Vols., suffered a compound fracture of the right clavicle, by a fragment of shell, at Fredericksburg, Va., December 12th, 1862. There was very extensive injury to the soft parts. He was admitted to this hospital December 26th.

On February 18th, 1863, a large granulating surface, two inches deep, was covered with an ashy, gray slough, and the discharge was converted from pus into an offensive ichor; the edges were thickened and everted, and surrounded by the characteristic areola of congestion, fading away into a bronzed hue.

The ulceration here attacked cicatricial tissue, which disappeared very rapidly. The entire surface was treated with nitric acid diluted, and tonics and stimulants were given internally.

The acid changed at once the character of the sore. It soon commenced to granulate, and the repair was then as rapid as had been the destruction. He was discharged the service, April 7th, for partial paralysis of the right arm, from traumatic injury of the brachial plexus.

This case was easily treated, being recognized as gangrene at once, and terminated quickly in convalescence, with a perfect recovery. The constitutional symptoms were never severe, although the man was anæmic, and had great mental despondency.

He was also removed from the crowded ward, and placed in a more salubrious one in the brick building.

CASE IV. Charles Underwood, Co. D, 31st Georgia, aged 24, for a wound caused by a shell, on December 13th, 1862, at Fredericksburg, Va., suffered an amputation of the left leg at its middle.

He entered this hospital December 25th. Nothing interesting occurred until February 20th, 1863, when a granulating surface on the face of the stump became covered with a gray slough, and the discharge was changed from pus to an offensive ichor. He was anæmic and much depressed in spirits. This case occurred in the same ward, but on the opposite side from the previous ones. The ulcer was dressed with sol. of creasote, and tonics and stimulants given internally.

On the 23d he was removed to the brick building, his ulcer freely treated with nitric acid, and then dressed with a mixture of equal parts of bals. copaibæ and ol. ricini. The ulceration had never been rapid in this case, and it was only considered specific because other undoubted cases had occurred in the same ward.

The character of the ulcer soon became changed, the granulation was rapid, and he was finally transferred to military headquarters, May 4th, 1863, perfectly recovered.

CASE V. Isadore Wick, Co. D, 1st N. Y. Artillery, aged 32, had his right thigh amputated on the field, for a comminuted fracture of the tibia, received December 13th, 1862, at Fredericksburg, Va., caused by a minie ball.

He was admitted December 26th. I regret that I can give no account of his progress, but I learned that the flaps had been insufficient, and that the stump had been closing by tedious granulation. There had been a free discharge, and his general condition was, therefore, unfitted to withstand the depressing influence of hospital gangrene. His bed was on the same side of the ward, and in close proximity to the first case reported.

The operation had been a circular one; the granulation had entirely covered the end of the bone, and there was, when seen on the 18th Feb., only a narrow strip, not yet cicatrized, between the margins of skin. This was now covered with a gray slough, and had the characteristic fetid odour. It was dressed simply with the creasote solution, my faith in the

acid treatment having been shaken by the reports of medical officers who had visited the cases at Annapolis, Md.

*Feb.* 23*d.* The case was now considered an unequivocal one of hospital gangrene, and was removed to the ward selected for such cases. The cicatricial tissue had all yielded to the sloughing, and the subcutaneous connective tissue had been destroyed for two inches beneath the skin at the outer angle of the original incisions. No change was made in the local treatment, as the creasote was a perfect deodorant, and as good results were hoped for, from its local use, as had been reported from Annapolis.

The destruction was limited to the connective tissue until March 9th, when there was a margin of sphacelus half an inch wide in the true skin. The constitutional symptoms had been growing more grave. His mental despondency was most marked, his face pale and anxious, his pupils dilated, his pulse 100 per minute, and feeble, and his skin very moist; a free diarrhœa had also commenced.

The tonics and stimulants having produced anorexia and nausea, were replaced by a mixture of tincture of opium and hydrochloric acid, in such proportions that he took gtt. xvj of tr. opii, and gtt. iv of acid. hydrochlor. every fourth hour. Beef essence and milk punch were given as freely as his stomach would tolerate them.

11*th.* As his general condition became less favourable, the local action was changed from molecular death to sphacelus. The whole face of the stump has now a margin of black mortification of the skin, outside of which was the usual areola of purple congestion—the complete stasis of to-day becoming the sphacelus of to-morrow. The end of the femur, protected by rosy granulations, now protrudes from the black mass of sphacelus, the integument having become loosened by the destruction of the subcutaneous connective tissue and retracted. The presence of this mass of putrefaction seems to add to the nervous prostration—if indeed the absorption of such peccant material is not its sole cause. Pure nitric acid had been applied several times, but it had been found impossible to convey it into the depths of the ulcer.

21*st.* No change except for the worse had occurred. Stimulating poultices of cinchona, ginger, and flaxseed had been used locally, but with no benefit.

Antiseptics, such as the solutions of the chloride of soda, creasote, and permanganate of potash were necessary to purify the ward and render it endurable for his attendants. Nutrients and stimulants had been pushed to the last extent, and opium had been largely given for its supposed specific effect in the disease, as well as to allay suffering. The symptoms had been typhoid for several days; emaciation had gone on rapidly; there had been subsultus tendinum and muttering delirium with extreme prostration until this date, when death occurred.

The limb was removed after death and the specimen sent to the Army Medical Museum. The sphacelus had involved all the tissues for five inches above the divided bone, and there seemed to have been a faint effort to form a line of demarcation.

This was, at first, a very mild case, with no very decided constitutional depression, until the system seemed to be poisoned by the absorption of the products of the gangrene, when the ulceration became more rapid, and was finally, as the strength succumbed, converted into uncontrollable and

rapidly extending sphacelus, accounting satisfactorily for the unfortunate result.

The treatment locally had been, first, weak sol. of creasote, gtt. iv to water ℥j, made soluble by alcohol ℥j; and second, strong nitric acid; never fully applied, however, to the depths of the diseased tissues. The constitutional treatment was stimulating, sustaining, and tonic.

CASE VI. Patrick Morrisey, private, Co. K, 20th Mass. Vols., aged 46, had been wounded on the 13th Dec., at Fredericksburg, and suffered an amputation of the left leg at its middle.

He was admitted Dec. 26th, 1862. There had been no union; the flaps had sloughed and the bone protruded, as in almost every case transported hither on that occasion. He had been broken down by a free discharge and diarrhœa. His bed was in the same ward, and on the same side with the previous cases, and his wound was dressed by the same medical officer and nurses.

*March* 6. His leg for six inches above the face of stump was swollen, erysipelatous looking, and riddled with small orifices leading to abscesses. The face of the stump was composed of purplish, lowly organized, cicatricial tissue, upon which a patch of sphacelus as large as a nickel penny, surrounded by the livid purple areola, now appeared. This was freely incised, touched thoroughly with pure nitric acid, and dressed with a fermenting poultice sprinkled with sol. sodæ chlorinat. Internally, gtt. xv of McMunn's elixir of opium were given every fourth hour.

This attack was ushered in by nausea, rigors, and fever; and the patient had a desponding, yet anxious expression of countenance. His diet was "extra" with stimulants. He was at once removed from the large ward and placed in a pleasant one selected for these cases on the second story of the brick house.

9*th*. The edges have yielded until the ulcer is now two and a half inches in diameter, covered with a tough yellow slough, which adheres strongly and extends deeply into the tissues of the centre. The pure acid was again thoroughly applied both to the diseased surface and to the areola. Internally a mixture of tr. opii, gtt. xvj, acid. hydrochlor. gtt. iv, every three hours, with extra diet and stimulants, was ordered.

12*th*. Ulceration was unchecked, was now three by two inches in extent, and the margins, undermined by destruction of connective tissue, were "piled up," thickened, and everted. There was diarrhœa with decided nervous prostration. The sloughs were all removed with the forceps and scissors, until the vascular tissue beneath was reached, the sore, well dried, was thoroughly cauterized with nitric acid, and dressed with a poultice and disinfectants. Elixir vitriol was ordered for the diarrhœa.

13*th*. The appearance of the sore was improved, and the general condition was better.

14*th*. Granulations were now seen on the sore, and the areola had lost its livid hue.

*April* 20*th*. An immediate improvement in the general condition followed the thorough acid treatment of the ulcer. The tongue became clean, the diarrhœa was checked, the appetite returned, the food was assimilated, the whole expression of countenance was changed from anxiety to cheerfulness, the gnawing pain was relieved, and the patient slept soundly. The appearance of the sore was also changed as suddenly from

a foul, offensive, sloughing ulcer, to a rosy, granulating surface, in which repair was as rapid as the previous destruction.

This man recovered with a good stump, and was transferred to St. Elizabeth Hospital to receive an artificial leg.

CASE VII. John Jordan, private, Co. H, 2d Maine, aged 20, was struck at Fredericksburg, Va., Dec. 13th, 1862, by a fragment of shell, which passed across the right thigh below Poupart's ligament, through the scrotum, destroying the right testicle, and behind the left thigh, producing in its course very extensive but superficial wounds of the anterior portion of right, and posterior portion of left thighs. He was admitted Dec. 26th, 1862, and placed in Ward No. 5.

*Feb.* 27, 1863. He had febrile disturbance and anorexia, a yellow furred tongue, an anxious, restless expression of countenance, and a burning pain in his left thigh. There was, on the right thigh, a granulating surface three by two inches in dimensions, level with the integument and cicatrizing rapidly: a smaller, equally healthy surface remained unhealed on the scrotum; whilst on the posterior portion of the upper part of the left thigh, an ulcer, three by two inches in extent, was found, oval in shape, covered with an ashy, gray slough, with its margin thickened and everted, surrounded by a livid areola, and, instead of normal pus, discharging a thin fetid serum mixed with debris. He was at once removed to the house, the whole diseased surface was touched with pure nitric acid, and dressed with the creasote lotion: stimulants and the best extra diet, with beef essence and milk punch at short intervals, and ferri. et quin. citrat. three times daily, were ordered.

*March* 5. The attempt to push the nutrients and stimulants produced, as it generally does, anorexia, nausea, vomiting, and diarrhœa. The tongue became thickly coated with a yellow fur, and dry and red at the tip; and so great was the gastric disturbance, that all medicines were discontinued and the stomach allowed to recover its tone by rest, no longer being teased either by drugs or excessive and undesired nutriment.

No benefit followed the local application, and the ulceration had extended in every direction. There was the characteristic margin, preceded by the areola of livid stasis, preparing the tissues for their rapid destruction. The connective tissue beneath the skin had been destroyed, so that the skin for one inch from its margin was perfectly movable. The muscles separated from each other by the death of their connective tissue lay in the wound, bathed in its discharge, but rosy and florid, and resisting the advance of the disease.

This sore was so unmistakably hospital gangrene that several pictures of it were taken by direction of Surgeon Brinton, which represent well the surface of the ulcer, dripping with its thin serous discharge mingled with shreds of dead connective tissue, its "piled-up," thickened, and everted margin, surmounted by a thin line of vivid redness, and its broad zone of purple congestion, shading away into a bronze hue: the depth of colour in the areola indicating the engorgement of the small vessels, and its hue, the feebleness and slowness of the movement of the blood.

It was determined to try the opium treatment, with hydrochloric acid as a tonic, and this mixture was given in the proportion of tinctura opii gtt. xvj, with acid. hydrochloric. gtt. iv, every three hours. The sore was dressed with a stimulating poultice composed of flaxseed, cinchona, and ginger, mixed with porter.

11*th*. Under the use of the acid internally, the tongue had become clean

and moist, the tone of the digestive apparatus improved, and a fair quantity of food had been taken. Porter and ale had been given as the stomach would retain them. But little change had taken place in the character of the ulcer, which was eight inches in length by seven in breadth, extending to the perineum, and irregularly oval in shape. The muscles exposed (the semi-membranosus and biceps) had yielded, and were now almost divided. The sores on the right thigh and scrotum had not been in the least affected, *but were cicatrizing rapidly.*

The entire surface of the gangrenous sore was now thoroughly cleaned, all sloughs and shreds removed with forceps and scissors, was well dried with lint and carefully painted with pure nitric acid. The brush, charged with acid, was passed beneath the excavated margin, in some places more than an inch. The patient was etherized, and this acid application was made most carefully and completely. This was considered a *dernier ressort*, for, although the capacity for taking and assimilating food seemed to have been increased by the acid treatment internally, yet his strength was daily diminishing from the exhausting discharge and from the absorption of the products of the gangrene.

On the succeeding day an entire change in the sore was observed; there had been no extension of the gangrene, the fetid odour was gone, and the discharge was more consistent and less serous. In a few days more all the shreds of dead fascia were removed, and the surface was found to be perfectly healthy. The contrast between the ragged, offensive, yellow-coloured ulcer, before the last application of acid, and the florid, perfectly normal, granulating surface, which replaced it, was as gratifying as it was surprising. With the local there was also a constitutional improvement. The appetite became voracious; the patient slept well; there was no pain, and the process of repair was very rapid. The acid was continued internally.

*April* 1. The sore was now two by three inches in extent, and cicatrizing rapidly.

20*th*. But a small surface yet remained unhealed. The patient was in perfect health, had gained flesh very rapidly, and was now on crutches.

There was some contraction of the flexors, as the biceps and semi-membranosus were both involved in the destruction.

The most remarkable circumstance in this typical case is the fact that when the gangrene attacked the granulating surface of the left thigh, the equally large granulating surface of the right thigh was unaffected; and that whilst the gangrene was ravaging the left thigh the rapid cicatrization of the right proceeded uninterruptedly. The discharge from the left thigh was so profuse that no precaution would have prevented the virus from coming in contact with the excoriated surfaces of the scrotum and right thigh. If, therefore, the disease be propagated by inoculation, all the circumstances were favourable; since the proximity of the thighs at their upper part, and a denuded surface on the scrotum, that might act as a link, render it certain that a portion of the great discharge from the left must frequently have been placed in contact with both of the other sores. If, on the other hand, the gangrene be not a local but a constitutional disease, why should it spend itself on one granulating surface when there were two others equally obnoxious? The contrast between these sores was marked; for whilst the

tissues of the left thigh were melting away under one's very gaze, the process of repair in the scrotum and right thigh was progressing as rapidly as under the most favourable circumstances. In its earlier stages this case was twice treated with nitric acid, and perhaps imperfectly, from its not having been carried into the recesses of the ulcer.

The system of urging nutrients, stimulants, and tonics, irrespective of the natural desires of the patient, is, I am satisfied, pernicious. The vital energy being depressed, the digestive organs are enfeebled; and the introduction of milk-punch, beef-essence, eggnog, &c., with stimulants, porter, ale, &c., into an unwilling stomach, simply produces anorexia, nausea, vomiting, and diarrhœa. The tongue became furred and dry, and there was a perfect disgust for all food. The hydrochloric acid was given to correct this condition; and whether its action was confined to the stomach in rendering soluble the aliment, given in very small quantities, or whether its action was catalytic or eliminative, I shall not pretend to state, but under its influence the tongue became moist and clean, and the patient made known his desire for food. Nutrients were then given more freely as his appetite returned. The recovery of this man is due, first, to the thorough application of nitric acid to every portion of the ulcer, which changed its specific nature immediately; and, second, to the combined effect of acid and opium internally. After the last complete application of acid the sore was changed in character, the areola disappeared, the surface became clean, the margins lost their elevated appearance, the serous discharge became purulent, and the offensive odour was entirely destroyed. An equally marked improvement occurred in his general condition.

CASE VIII. R. W. Plummer, private, Co. D, 1st Delaware Vols., aged 34, was struck on the outer aspect of the left thigh, at its middle, by a bullet, at Fredericksburg, Va., Dec. 13th, 1862. The bullet struck against his bayonet, and penetrating his leg caused a severe flesh wound.

He was admitted Dec. 26th, 1862. The ball dropped out Jan. 1st, 1863. This was the only case of gangrene that occurred in the brick building, and appeared on the upper floor, at a distance and entirely disconnected from the wooden pavilion where the other cases were treated.

*Feb.* 15. The wound was almost closed.

*March* 9. For three days past there have been anorexia and fever. There is now an ulcer on the left thigh as large as a silver quarter dollar, with everted edges, livid areola, and a fetid discharge. The connective tissue has been removed from beneath the margins by ulceration, leaving the skin undermined. Pure nitric acid was applied to the ulcer, which was then dressed with solution of sodæ chlorinat., and tinctura opii and acid. hydrochloric. given every three hours internally.

12*th*. The ulceration having continued unchecked, nitric acid was again applied, followed by a poultice; the man was moved into the gangrene ward.

15*th*. The second use of the acid locally has changed the whole character of the ulcer. It is now about two inches in diameter, free from odour, rosy in colour, and granulating rapidly.

22*d*. This improvement continued until this date, when the repair had brought the bottom of the ulcer to a level with the surrounding skin, and cicatrization had fairly commenced. There was at this time a profuse diarrhœa from some error in diet, with depression of the vital energies, which was accompanied by a relapse into the gangrene. The sore is now covered with a gray slough, is very painful, and has the characteristic areola. The expression of the patient's face is very anxious and haggard. Nitric acid was most thoroughly carried into the recesses of the ulcer, and the acid and opium mixture ordered internally.

28*th*. The ulceration has extended very rapidly, and is now a perfectly characteristic specimen of hospital gangrene. The local use of the acid seemed to do harm, since the destruction of tissue was more rapid after its application. The general condition is alarming. There are uncontrollable diarrhœa and nausea. The pulse is very rapid and feeble, the skin relaxed, the mind dejected; and the expression of face, and the decubitus betoken profound debility. Nitric acid was again most carefully applied.

*April* 2. The ulcer now measures seven by six inches. The whole surface is dripping with a fetid, sanious discharge, laden with debris of the fascia and connective tissue; the skin, undermined, is separated from its attachments for the distance of one and a half inches from the free margin, which is "piled up," everted, and surrounded by an areola of livid, bluish redness, three inches in width. The general condition is most unfavourable. There are great prostration, profuse perspiration and diarrhœa; with a pulse of 130 and very feeble, and tongue red and dry; and a complete disgust for food, with nausea. His condition is so desperate, that I feel no hope of his recovery. The nitric acid, when last used, had only hastened the destruction of tissue, and after its failure, I was without a substitute. It had been twice used with no good effect, and had been applied most carefully to the entire surface. The nervous prostration, which is so prominent a symptom of this disease, was so profound that I think this man would have died within forty-eight hours, exhausted, but for the treatment employed. The constant burning pain had destroyed his rest; his diarrhœa was profuse, his skin bathed with perspiration, his stomach so irritable as to reject all nutrients and stimulants, and the expression of his face was dejected, depressed, anxious, and haggard to a remarkable extent.

The surface was again carefully cleaned of all sloughs and discharge, and thoroughly cauterized with the solution of bromine, employed by Surgeon Goldsmith, U. S. Vols., viz.:—

Bromine, ℥j; potassii bromid., ʒiij; aquæ, ℥iij. The patient was anæsthetized, and the caustic solution applied most liberally to the entire diseased surface, which was immediately deodorized, and covered with a tough yellow deposit. The sore was then covered with a piece of dry lint, a second piece of lint, wet with the bromine solution, was placed over it, upon this a piece of muslin spread with cerate, and over all a piece of oiled silk, confined closely with a roller, was bound; and the local effect of bromine was thus continued in the form of vapour. The burning pain disappeared; the antiseptic effect of bromine seemed to restore the appetite by destroying the virus that had been poisoning the whole system, and, for the first time for many days, he took some food.

*May* 4. The exposure of the surface of the body to the air at this application of the bromine was followed by a severe attack of bronchitis, with viscid and bloody expectoration, and severe dyspnœa, which was treated by warm cataplasms to the chest, and by expectorants.

*7th.* The ulceration has ceased, the odour disappeared, and the surface is now clean and rosy. The vapour has been used twice daily. An immediate improvement followed the use of bromine, both locally and constitutionally. The pain, diarrhœa, and profuse perspiration ceased, the appetite returned, and the nervous prostration soon yielded to the extra diet and stimulants. The bromine was used twice in solution, and continued in the form of vapour until the granulations became normal.

*23d.* He is convalescent, and the ulcer entirely cicatrized. The bromine produced this gratifying change, after the entire failure of nitric acid; nor do I hesitate to affirm that, but for its employment, the case would have terminated fatally.

CASE IX. George Zilch, Sergeant Co. K, 7th N. Y. Vols., aged 25, had his left leg amputated at its upper third, for a bullet wound received at Fredericksburg, Va., Dec. 13th, 1862.

He was admitted to Douglas Hospital December 26th, and placed in Ward No. 5. The stump had closed slowly by granulation, until there remained an ulcer as large as a half dime on its face.

*April* 14, 1863. This ulcer was inflamed around its edges, and covered with a white pultaceous slough; there was no constitutional disturbance, and the patient was allowed to remain on his crutches. The ulcer was cauterized with nitric acid, and dressed with solution sodæ chlorinatæ.

*18th.* The ulceration and areola are both enlarged, and the slough, yet very tough, is thicker. Acid was again used locally.

*21st.* He is feverish, and inclined to nausea; his pulse 120, skin hot, and tongue thickly coated. The ulcer is extending in depth, and he was removed to the gangrene ward.

*22d.* The solution of bromine was applied to the sore after cleansing the surface as much as possible of the tenacious slough. His general condition was unfavourable, and there was a tendency to diarrhœa and perspiration. Internally he took muriatic acid, with extra diet and stimulants.

*24th.* Bromine was again applied to the surface, and used in the form of vapour. The ulcer was now three inches in diameter, irregularly circular in form, with ragged, everted, and thickened edges, and surrounded by a purple areola. The slough was one inch in thickness, and resisted the action of the bromine.

*26th.* The sore is looking better; it has been disinfected since the first application of bromine, and the constitutional symptoms are better.

*27th.* A painting in oil was made to-day by Surgeon Brinton's direction, which would be pronounced a good representation of hospital gangrene.

*28th.* The slough is much thinner to-day, and the granulations are showing through the thin gray covering.

*29th.* The sore is much better, is becoming covered with granulations, and has lost almost entirely its specific appearance. There is no constitutional disturbance, no fever, no headache; the tongue is cleaning off, and there is a return of the appetite. The bromine vapour was discontinued, and a sol. sod. chlorinat. substituted.

*30th.* The livid areola has been changing daily in hue under the bromine treatment, has now entirely disappeared, and the sore is perfectly healthy.

*May* 6. He is still improving, and is taking tonics and nutrients.

*20th.* The sore is reduced to half its original size, and is now cicatrizing rapidly.

*24th.* There is now a surface as large as a penny unhealed. The patient's

health is very good; he is about the ward on crutches, and is no longer considered an interesting case.

We have in this case another instance in which the acid, locally used, proved useless, and in which the solution of bromine caused an immediate improvement. It was found necessary to apply the caustic solution to the ulcer three times, owing to the thickness of the slough, which was too closely attached to be removed by spatula or forceps. Its action here seemed to be to correct the fetor at once, to check the molecular death, and to change the hue of the areola, by causing a more healthy action in the capillaries. The gnawing, burning pain was relieved, and the patient was able to sleep in comfort. The absorption of the virus produced in the ulcer was prevented by its destruction, and the nervous system quickly regained its tone.

This man steadily improved, recovered with a good stump, and was finally sent to New York to be mustered out of the service.

I will conclude this brief clinical history by a short summary.

*Etiology.*—This disease made its appearance in a wooden pavilion, containing fifty beds, most of them occupied by very seriously wounded men unable to leave the building, with a cubic capacity of 1050 feet to each bed, heated by ordinary radiating coal stoves, devoid of any system of ventilation, and having no ingress for pure air, nor egress for foul, except through the windows and doors. This want of pure air was combined with a want of strict police, and a careless and unscientific method of dressing the wounds, rancid ointments being largely used instead of the ordinary water dressing.

No case of gangrene was received as such into the hospital, nor is it probable that it was otherwise introduced.

Although a majority of the cases in this ward escaped gangrene, yet there was evidently some depressing agent at work, since but few wounds healed rapidly. The patients seemed also dispirited, homesick, and moody. Those who were attacked were removed to a ward in the brick house, where they were isolated, and at the same time placed under better hygienic influences.

Two shafts for foul air, connected with the stoves, which withdrew the foul air from near the floor, had recently been placed in the ward by order of the Surgeon-General. This was not considered sufficient, and the long doors of these foul air shafts were kept constantly open. Strict attention to cleanliness and careful dressing was enforced, and, what might have been a very severe epidemic, was confined to few cases. The upper row of windows were rehung in such a manner as to direct the currents of cold air admitted in a line with the roof, and, to crown all, the *ridge ventilation* was applied to the pavilion.

These precautions, and an improvement in the diet of the house, giving more vegetables and antiscorbutics, enabled me to prevent any further serious manifestations.

| No. | Names. | Ward. | Side. | Date of attack. | Grade of disease. | Result. | Treatment. |
|---|---|---|---|---|---|---|---|
| 1 | Otto Kossacke | 5 | West | Feb. 15, 1863 | Ulceration | Cured | Nitric acid. |
| 2 | L. D. Thurston | 5 | " | " 15, " | Sphacelus | Death | " |
| 3 | Sam'l Fossett | 5 | " | " 18, " | Ulceration | Cured | " |
| 4 | C. Underwood | 3 | East | " 20, " | " mild | " | " |
| 5 | J. Wick | 5 | West | " 28, " | Sphacelus | Death | " |
| 6 | Pat Morrissey | 5 | " | March 6, " | Ulceration | Cured | " |
| 7 | J. Jordan | 5 | East | Feb. 27, " | " | " | " |
| 8 | R. W. Plummer | 1 | Building | March 9, " | " | " | Bromine. |
| 9 | Geo. Zilch | 5 | East | April 14, " | " | " | " |

There were three other wards of like construction, with Ward No. 5, but two of them were unoccupied, and the third one contained fewer, and less serious cases.

The foregoing table indicates that of the nine unmistakable cases reported, eight appeared in Ward No. 5; and that of these eight five occurred on the west, and three on the east side of the ward. Although these facts would suggest the probability of inoculation, yet I cannot but remember that there were at least thirty-five other wounded men in this ward who escaped, although the disease had been in existence several days before Feb. 17th, when I took charge, and no precautions against contagion had been employed.

I shall not attempt to argue here the long-disputed point of contagion or *non*-contagion, but simply state it as the result of my observation, that I saw no well-marked instance of inoculation, whilst I did see many wounds escape this influence where inoculation was not only possible, but probable. Nor was it necessary to invoke the aid of any specific virus, since the unfavourable hygienic influences which had surrounded these men from the date of injury, Dec. 13th, and the date of admission into hospital, Dec. 26th, 1862, to Feb. 15th, 1863, were sufficient to produce, in all the cases treated in Ward 5, a well-marked cachexia—neither scorbutus nor anæmia, but more unmanageable than either, and due, most probably, to the absence, simply, of fresh, pure air in sufficient quantities. With no further improvements than those mentioned, a marked change for the better took place in the other inmates of this ward. Their wounds became healthy, and healed rapidly, and their spirits became cheerful.

It will be observed from the table that I have described two grades of hospital gangrene, the one mild, generally manageable, and characterized by ulceration or molecular death of the tissues, spending itself generally in the subcutaneous and intermuscular connective tissue; the other, more rapid in its course, more fatal, less amenable to treatment, and distinguished by sphacelus or mortification, *en masse*, of the invaded tissues. It will be seen that of the nine cases, seven are described as ulceration, and two sphacelus, and the latter both fatal.

These two cases last mentioned were entirely uninfluenced by the treatment employed. The rapid invasion and advance of the mortification, and the impossibility of reaching it with nitric acid, to influence it locally, left but little to do, but to observe its profoundly depressing effect on the vital

forces. Bromine may prove the antidote in such cases, but its virtues were then unknown to me.

*Treatment.*—Recognizing the depressed condition of the first few cases, I endeavoured to remedy it by giving at short intervals nutrients and stimulants, with such tonics as seemed proper; and milk punch, alternating with beef essence, porter or ale, and egg-nog, was at first given, regardless of the desires of the patient. The ferri et quin. cit. with sherry wine was given in doses of gr. vj to x three times daily. This system was found injudicious, since it overpowered the feeble digestive organs, and caused nausea, vomiting, and diarrhœa; it was suspended, and acid. hydrochloric. gtt. iv, in combination with tr. opii gtt. xvj, were given every three hours. Under this treatment the tongue became moist and clean, and the appetite returned sufficiently to cause the patient to ask for and enjoy a reasonable quantity of food. The opium was given to allay the gnawing pain and to give rest and sleep, as well as to obtain any specific influence over the disease which it might possess, as claimed for it by the older writers.

The local treatment consisted at first in the use of undiluted nitric acid, freely applied to the entire surface of the ulcer. The table indicates the success of that treatment. Of the nine cases, all were treated with the acid in the early stages. Of these, two were fatal, and two resisted the acid; or, in other words, in four cases it was useless. Of these four, the two fatal cases were not treated otherwise, whilst the other two were treated with success, with bromine. The five cases treated successfully with acid are marked ulceration, and were milder than those that proved fatal, or than those that were treated with bromine successfully.

The dressing, after the use of the acid, was an antiseptic wash, either creasote or liq. sod. chlor. in a dilute solution. In some instances a yeast poultice, or a stimulating one of cinchona, ginger, and porter, seemed to assist in cleaning the surface.

Where the sore lost its sloughing character, after the use of nitric acid, the mild antiseptic washes were sufficient to encourage rapid granulation.

Of more value than the acid is the solution of bromine in water and bromide of potassium, proposed by Surgeon Goldsmith, U. S. Vols. Two cases were treated with this agent, in both of which nitric acid had failed. One of these would, doubtless, have proved fatal, whilst the other was progressing rapidly, although the acid had been used several times without benefit.

The action of the bromine is that of a caustic; all the necrosed tissues are converted into tough yellow shreds, and are perfectly deodorized. The ulceration seems to be checked at once, whilst the nervous system, no longer depressed by the absorption of the fetid products of the mortification, soon recovers from its depression. The areola loses its livid hue, becomes more crimson, and finally disappears; the sloughs are rapidly thrown off, and a rosy, florid surface appears beneath.

The bromine was also used in the form of vapour, confined to the surface by oiled silk. Its antiseptic influence is very powerful, since not the least odour could be perceived on dressing these gangrenous sores, even when they had been covered closely with oiled silk for twelve hours. From its antidotal efficacy in these two cases, I have formed a high opinion of its value in the local treatment of this disease.

*Microscopy.*—The discharges from several of these cases were examined, to ascertain whether some of the speculative views in regard to the presence of fungi and their influence in producing the disease could be sustained, but no fungi were found.

The discharge consisted of fluid, granular matter, and debris. The connective tissue seemed to have been broken down into unrecognizable granular material. The fibrous tissue was softened and easily teazed out, and in the muscular tissue the striated appearance was lost before the fibrous.

No evidence of textural growth was found in the discharges, although the "piled-up" and thickened margins of the ulcers would probably reveal, on examination, a multiplication of the connective tissue-corpuscles, as reported in a similar group of cases at Annapolis, Md., by Assistant Surgeon Woodward, U. S. A.

Since the preceding report was drawn up, four other cases of hospital gangrene have been observed, occurring sporadically, and treated with success with bromine. Their clinical histories are very briefly offered for consideration, in addition to those already submitted. No other cases have occurred in this hospital. It will be observed that three of these four cases were fully treated with pure nitric acid withou benefit, and that the four did yield eventually to the local application of bromine. Where that remedy has required heretofore several repetitions, it would now be used more energetically. The diseased surface would be thoroughly cleansed of all sloughs, by removing those portions dead, yet tenaciously adherent, with the forceps and scissors, and pure bromine would be freely used by means of a glass pipette or a syringe. A number of the cases reported I am now satisfied would have proved fatal but for this local treatment; and it will be a proud satisfaction to Surgeon Goldsmith to know that he has not only already been instrumental in preserving so many valuable lives, but that he has provided the military surgeon with a defence against one of the most deadly and obdurate of his antagonists.

In conclusion, the writer regrets that circumstances do not permit him to render these clinical histories more acceptable to the critical reader. The report was made to the Surgeon General for the future use of the surgical historian of the war, and now meets the public eye in this crude form because it has been represented that further evidence as to the virtues of bromine might be of service in the exigencies of the coming campaign.

CASE X. Michael Flood, age 24, priv. Co. D, 33d N.Y. Vols., was struck by a minie ball at the battle of Chancellorsville, May 3d, 1863, which entered the right thigh anteriorly, comminuted the femur for four inches at the junction of the middle and upper third, and escaped posteriorly. He was admitted on the 8th of May. This man had been suffering from diarrhœa, and was in a feeble condition. The usual profuse suppuration followed the injury, thus reducing his strength still further. The leg was lightly dressed, was supported by sand-bags, and extended by means of a brick attached to the limb by a band of adhesive plaster. On July 23d, the inner surface of the thigh, at its middle, was found red and inflamed opposite the seat of fracture, and in the centre of this diffused redness there was a spot very tender on pressure, slightly softened, and indicating an approaching abscess. This was treated with a poultice. On the 24th, a small black spot of sphacelus was observed in the centre of this inflamed region, which was easily detached, and then revealed a sloughing condition of the connective tissue.

No previous abrasion of the skin existed, nor any wound which would have permitted of inoculation; nor was there any other case of gangrene then under treatment. The diarrhœa simultaneously increased, and the patient's condition became rapidly worse. The ulcer was treated with the solution of bromine and bromide of potassium. This was followed on the following day by pure nitric acid, with the apparent effect of adding to the rapid destruction of tissue. On the 27th, the ulcer was in dimensions five by four inches, with irregular ragged edges, everted, thickened, and extensively undermined at the margins; and, in a word, presented the characteristics of severe hospital gangrene. It was now thoroughly treated with pure bromine. The improvement was marked; the ulcer became deodorized; lost rapidly its sloughing, ragged look; became clean, then florid, from rapid granulation, and in a few days was converted into a perfectly healthy, rosy surface. The man's broken condition gave no hope of his recovery. There was still a free discharge from his fractured femur, his diarrhœa continued unchecked, and from these he sank exhausted, and died on the 6th of August. The gangrene here did not attack the gunshot wound through which the discharge from the seat of fracture escaped, but invaded a new unwounded surface, and one upon which no abrasion was known to exist. The gangrene was perfectly removed previous to his death.

CASE XI. P. C. Barton, Co. D, 26th New York, age 25, was struck at Chancellorsville, May 23d, 1863, by a piece of shell, which comminuted with extensive laceration the right tibia and fibula, at the middle, and fractured the right femur at the junction of the lower and middle third. This was a most severe wound, since the soft parts were so greatly injured. He was admitted on the 8th, his leg placed in a bran-box, and slight extension attempted by fastening the foot to the foot-board and elevating the lower end of the bedstead. Profuse discharge and occasional attacks of diarrhœa reduced his strength, whilst his wounds were undergoing rapid repair. On July 1st, he was removed to a ward filled with other wounded men, and in a few days the granulating wound on his leg became grayish, and the discharge thin and offensive. The wound of the thigh had almost closed. This was recognized as mild hospital gangrene, and was treated with strong nitric acid, followed by yeast poultices. No improvement followed. The cicatrized tissue, the offspring of the previous repair, was rapidly removed, the ulceration spread under the sound integument, and the sore assumed the characteristic appearance of gangrene. Stimulants

and mineral acids were given internally, but rapid emaciation and general prostration ensued from the continuance of the diarrhœa. The sore was then treated with the solution of bromine, but required several applications to check the ulceration. Pure bromine would now be employed in such a case. This man was moved to a better ward on July 30th, and the ulcer was then seven inches in length by four in width, occupying the outer side of the right leg.

Soon after his removal an abscess formed in the outer portion of the right thigh, the pus was evacuated, and gangrene immediately attacked the walls of the cavity; this extended with great rapidity, became four by three in extent in two days, and was immediately arrested by the bromine. No hope whatever was entertained of this man's recovery. A severe comminuted fracture of both bones of the leg, a compound fracture of the same femur, and two severe attacks of gangrene, combined with an obstinate diarrhœa, had brought him to the last stages of exhaustion. By the 12th of August his ulcers were normal in appearance, and were granulating rapidly; the bones had united, and his diarrhœa had been checked by nitrate of silver and opium. The improvement was gradual, but constant; his stomach recovered its tone, the quantity of food was increased; his whole condition became more favourable, and he was finally sent home on the 20th of September, his term of service having expired. He was able to travel safely, and his wounds were almost closed.

CASE XII. Wm. Hutchinson, age 32, Co. F, 107th New York, was struck by a bullet at Chancellorsville, May 3d, 1863, in the middle of the right tibia, which comminuted the bone, without, however, fracturing it through. He was admitted June 17th; the wound was discharging freely, and, shortly after his admission, several fragments of bone were removed. He was kept quiet in bed and his leg dressed with water. On the 10th of August the open wound lost its healthy look, and the discharge became thin and offensive. On the 18th the case was beyond doubt a mild one of hospital gangrene. There were the burning pain, the livid areola, the thickened everted edges, and the deep, tenacious, gray slough occupying the former seat of the opening. No effort was made to remove this necrosed tissue, and hence the application of the pure bromine produced less than the usual effect. For six days after the 18th the bromine was applied daily, and followed by yeast poultices. No ulceration occurred after the first application; but at the expiration of the time stated, a florid, healthy surface replaced the gangrenous one; the excavation was deep and extensive enough to contain a large egg. After this complication the wound filled up rapidly, the man received a furlough, but was enfeebled by the long-continued discharge resulting from local necrosis.

CASE XIII. James Hogan, age 47, private, Co. A, 127th Pa. Vols., was struck at Fredericksburg, Va., December 13th, 1862, by a minie ball which comminuted his right tibia. A resection of six inches of the shaft was performed at a field hospital. The fibula was uninjured. A tedious and almost hopeless convalescence, and the removal of sequestra from both upper and lower extremities of the tibia, found him, after the closure of the extensive incision, in good health, and with only a very small granulating surface near the tubercle of the tibia unhealed. This was attacked by hospital gangrene, was treated ineffectually with nitric acid, and penetrated so deeply as to make the involvement of the knee-joint probable.

Two or three applications of pure bromine at once checked the destruc-

tive action, but not until an opening large enough to receive a hen's egg had been produced. The granulation was rapid; the constitutional symptoms of gangrene soon disappeared, and the man recovered with a perfectly useless leg, since a hiatus of eight inches remained between the two extremities of the tibia. He was sent home on Oct. 12th, 1863, in good health, his term of service having expired.

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ART. VIII.—*Observations upon One Hundred Cases of Intermittent Fever in which the Sulphate of Cinchonia was used as a Substitute for Quinia.* By A. PAUL TURNER, M. D., one of the Physicians to the Howard Hospital and Infirmary for Incurables.

WHEN we consider the extremely limited regions to which the production of the desirable varieties of the Cinchona is confined, and the reckless destruction pursued in collecting it by those solely interested in an immediate pecuniary reward, and the utter neglect of the respective South American Governments to enforce the regulations necessary to its preservation, we may well feel assured that unless some available substitute for quinia be introduced, the supply is liable at any time to suddenly fail. So little interest in the subject is manifested in the regions from whence our supplies are now derived, that it is said in the collection arranged at the late International Exhibition at London, not a single specimen was placed there by the Spanish or South American States. In view of these facts, the British and Dutch Governments have been induced to establish nurseries for the cultivation of the Cinchona in their East India possessions. In carrying out the attempt, numerous difficulties are to be overcome, and it further remains to be ascertained, if even an apparent maturity be obtained, so far as all external characteristics are concerned, whether the bark possesses the full medicinal properties. To a certain degree the valued alkaloids in the Cinchona of the Indies may be in less quantity,[1] as the active resinoid principle of the hemp is almost wanting in those specimens cultivated elsewhere than the Indian Archipelago. Casting aside all this, we must admit that a considerable length of time will elapse, perhaps not less than twenty years, before a supply can be looked for from new sources, and an efficient substitute must, therefore, be procured, unless chemistry places at our disposal some method by which these desirable preparations can be directly formed. Notwithstanding we possess salicin, bebeerine, and the active principles of the oak, dogwood, and other indigenous plants, with copper, arsenic, etc. etc. of the mineral kingdom, all having more or less reputed antiperiodic properties, and useful in their

[1] [Recent investigations are said to show that the bark of the Cinchona trees raised in India is very rich in quinia.—EDITOR.]

proper places, yet it has always been desirable to secure one more energetic and certain in its action than those of the first class, without the well-known disadvantages attending the latter substances of not only being tardy in action, but requiring such care in administration as to cause their claims to be repudiated by many.

As early as 1821, when Pelletier and Caventou discovered that in Peruvian bark there existed another alkaloid besides quinia, separable from it, and having analogous chemical relations, they suggested that there might be a similar identity between their therapeutic properties, and inferred that it might be no less available as a febrifuge. The subject was accordingly investigated by Magendie, Gittermann, Chomel and others, who, after slight inquiry, rejected its pretensions as such an agent; the last-mentioned experimenter doing so after using it in one case only. After this extremely limited trial, little more attention was bestowed upon it, until inquiry was prosecuted with more vigour by Dr. Bally, in 1825, who succeeded in immediately checking twenty-five out of twenty-seven cases of intermittent fever, and even the other two yielded upon judicious perseverance in the same remedy. Other experimenters in Italy, France, and Germany, among whom were Mariani, Wutzer, Dufresne, Potier, and also Bardsley, of England, all reported in its favour, even when compared with quinia. In this country attention was specially directed towards the subject by Prof. Wm. Pepper (*American Journ. Med. Sciences*, January, 1853), who administered this substance with signal success, confirming all previous statements as to its efficacy, having promptly checked eleven out of fifteen cases of intermittent fever, and two of those remaining yielded to a second administration of the same febrifuge. The greater number of these cases were of many months' duration, attended with enlargement of the spleen, and more or less derangement of the general health, which would tend to make a successful result still more conspicuous.

The humble position reached by this article of the materia medica as a therapeutic agent, must not be attributed to the fact that it has been tried and found wanting, but rather to the tardiness of physicians in confiding in newly proposed medicinal agents. But another and more obvious reason is perhaps due to the fact that quinia has been found so effectual as a febrifuge, that there scarcely exists a hope of ever securing a more efficient one, and consequently so long as this can be readily procured, a substitute for it will meet with little attention. The demand for quinia has now not only increased for the cure of disease, but it is issued as a prophylactic to soldiers in the field, not only among our own in the South ern States, but among the armies of Europe stationed in the malarious regions of China, India, and Mexico. These increasing demands for consumption, and the non-increase but rather decline in supply of the material from whence it is derived, can of course have but one effect, that of making it more costly, and of urging us to seek an available substitute. In all

charitable institutions where it is desirable to reduce expense to the lowest point compatible with the object in view, an efficient substitute is urgently demanded. It was in view of this fact that I was induced to specially observe a certain number of well-defined cases of intermittent fever, presenting themselves at the Dispensary of the Howard Hospital, in hope that something positive could be ascertained as to the true value of the sulphate of cinchonia. The first case recorded was August 15th, and the last Oct. 25th, although during this interval there were not less than two hundred instances in the general register of the house, yet only those are specially recorded and embodied in this report as were well defined, and had been under no other immediate treatment. Where obscure cases afterwards assumed this character, or a more remittent form, the same agent was employed with equally satisfactory results. The epidemic was one of unusual violence and duration, many cases assuming a severe congestive form, with more or less visceral disturbance, but one of the most prominent features was the disturbance of the nervous system; the neuralgic symptoms were so prevalent, that not unfrequently, by their occurrence, the fever was anticipated some days before it assumed the decided form, and after the subsidence of everything connected with the febrile state, these general pains simulating rheumatism often appeared, not unfrequently affecting a special nerve or even one of its branches with a violent neuralgia, which yielded with the other symptoms to the antiperiodic.

1. *Mode of Experimenting.*—The frebrifuge was administered at the onset before it was fully ascertained whether the fever was about to steadily proceed with its paroxysms, or whether, on the other hand, it would spontaneously disappear of itself, but as the same course is pursued where the substance used is of another variety, it will be seen that the comparison does not present that variance which might at first be supposed.

2. *Use, Formulæ, Mode of Administration, Duration of Use.*—In all instances the salt used was the disulphate of cinchonia, of known purity, directly from the laboratory. The smallest quantity given during a single intermission to arrest the paroxysms was five grains, to a child two years of age, suffering with a tertian form after having been troubled the entire summer with cholera infantum, and was in consequence much reduced in strength before the febrile condition appeared, with little appetite and irritable stomach. A slight purgative of hydrarg. cum creta was given as soon as the fever began to decline, then one and a half grain of the antiperiodic was administered every hour, until the above quantity had been taken. There was no return of the chill at the expected time, and a scarcely perceptible fever, probably due to some indiscretion in diet; from this time forward there was no return, although the general state of the system, which improved very slowly from the previous disorder, was one quite favourable for continuance of the disease. The maximum quantity used during a single

intermission was thirty grains, to a female aged 30 years, in doses of five grains every two hours; the only effect noticed aside from checking the paroxysms was considerable vertigo and buzzing of the ears, but no headache or other painful symptom. The largest dose given at one time was fifteen grains to a stout and apparently otherwise healthy man, three hours before the expected return of a paroxysm, which had been of unusual violence, lasting some hours, and succeeded by extreme gastric disturbance and general depression. He had previously experienced four attacks, each coming on at about 12 at noon, followed at 5 P. M. by the fever, which persisted during the night with active delirium until 6 the next morning, when general muscular pains harassed him until the hour for return of the succeeding cold stage. After a brisk purgative, which operated in two hours, the mentioned quantity of the febrifuge, suspended in tinct. lavand. c., was administered at once. This was followed by no nausea or other unpleasant symptom, except the fulness of the head which appeared about the expected time of return, but no chill or symptom of it was observed, except slight gastric uneasiness at the hour when vomiting had usually been troublesome. Three weeks afterwards there had been no return of the disorder, and he promised to visit us should another recur. In a female, aged 29 years, with a quotidian of one week's duration, giving rise to such disturbance of the system that she insisted upon immediate relief, and to effect this one scruple of the sulphate of cinchonia was given at two doses with an interval of one hour between them as soon as the febrile state declined. It was attended with no other disagreeable effect than the cerebral symptoms, which were not so distressing to the patient as those resulting from quinia, with whose properties in this respect she was familiar, having suffered each autumn from intermittent fever for some years past. The common dose for an adult was about three grains, repeated every hour until the desired quantity had been exhibited, which usually was one scruple. I now feel assured, however, that in many instances a less quantity will effect the desired result, but as this inference was drawn rather late, it was thought most judicious to continue as begun, that the relative effects between the different cases might not be thereby impaired.

As cinchonia is more soluble than any of the other salts obtained from barks, the most efficient mode of its administration was that of a solution with one of the mineral acids, usually the aromatic sulphuric, but it readily combines with tinct. ferri chlor., U. S. P., and in the proportion of two scruples to the ounce of the last may be used as a prophylactic in the dose of ten drops, in water, an hour before each meal. With organic acids it is no less soluble, and when desirable to combine with it the citrate or tartrate of iron, the citric or tartaric acids, respectively, will be found ready solvents. It may be given in pill or powder, but the solution is preferable. In using cinchonia in reference to the febrile state the same rule is to be followed as when quinia is prescribed, and in all cases an attempt was

made to begin its administration during the absence of fever, and so early that the last dose should precede the chill some two or three hours. This was the rule adopted, but, of course, in many instances it will be found impracticable, where larger doses at shorter intervals will be necessary, and in some instances the first portion was given during the declining fever of one paroxysm and the last at the commencement of the cold stage of another. In none did we observe the one prolonged or the other aggravated by such a course, and it has uniformly been our purpose to give the total quantity of the antiperiodic necessary during the intermission, instead of pursuing the course advocated by some of exhibiting certain quantities at stated periods until the commencement of the cold stage, then waiting until the succeeding intermission, and so on, until the desired effect is produced. In following this plan we have yet to see anything sufficient to cause us to pursue another. The duration of time over which the use of the alkaloid extended, varied, being discontinued as a usual thing as soon as the paroxysmal aspect was destroyed; it was then occasionally given at the end of six days to prevent a recurrence, as it is well known that all intermittents tend to return at the seventh, fourteenth, and twenty-first days. Hence a third of the original amount found necessary to arrest the progress of the paroxysms was repeated at each septenary period, and where this direction was carefully carried out, we do not remember more than two instances where a return was not prevented. One of these was a gardener, living in a marshy district, and when the quantity of the febrifuge was increased there was no return. The other was that of a female, aged 29 years, with a tertian of ten days' duration, which was expected to return at the stated day and hour, but it was very desirable to prevent, if possible, another paroxysm; five grains were given every hour until a scruple had been used; there was no return of the chill or fever. At the end of a week ten grains more were administered, but a paroxysm occurred the next day. A scruple in three grain doses was given to arrest the fever, which remained absent nine days, when it returned once more.

3. *General Accidents, Tolerance, etc. etc.*—Nausea and vomiting were observed to follow the use of this substance in five cases; two of these became more affected by continuing the dose, although one persisted in it after diminishing the quantity, and in the other no further attempt was made. The remaining three cases were children, in whom the gastric irritation was one of the most prominent and distressing symptoms, and as it soon subsided after an alkaline draught, it is scarcely proper, perhaps, to attribute it to the medicine.

Cephalalgia was quite prominent in six; one described it as acute in the frontal region, which was attended with a peculiar nausea, lasting some time, and returning after each dose; the cinchonia was not omitted on this account, but persevered in until all was used, after which there was neither return of the paroxysm nor headache. In another the

same symptom had previously occurred after the use of quinia, when it was more severe and enduring than after cinchonia. In reference to the peculiar assemblage of cerebral symptoms comprised under the term "cinchonism," it resulted in the majority of instances, but it was not observed that greater immunity was thereby secured in proportion as these signs were more marked or earlier evident. In one case the vertigo was so intense after twenty grains of this substance had been taken within ten hours, that the patient was unable to walk without falling, and she inquired if quinia was not the preparation given, as when this had been used by her on former occasions, the same effect had always been induced, but much more unpleasant from the severe pain attending it. This was remarked also by other parties.

The taste is not so bitter or durable as from quinia, and for this reason cinchonia can be administered to children where the former is stoutly refused. The impaired appetite and general feeling of *malaise* not unfrequently following the use of quinia, which to some is the most objectionable feature to its use, was not noticed to the same extent after cinchonia, and in some did not occur at all; on this account it may be preferred to other tonics of a similar character.

4. *Efficacy as an Antiperiodic.*—We previously remarked that the following cases, arranged for inspection in a tabular form, are those distinctly defined and recorded in reference to this feature alone; where the type is omitted and entered mixed, it is meant that at the beginning it was perhaps a quotidian, then merged into a tertian, and could not be so expressed without interfering with the assumed arrangement.

| No. | Age. | Sex. | Type. | Number of paroxysms before treatment. | Quantity of cinchonia administered. | Number of paroxysms after medication. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1 | 20 | Male | Tertian | Two | gr. xx. | None | |
| 2 | 40 | " | " | " | " xx. | " | |
| 3 | 13 | " | " | Three | " xv. | Two | |
| 4 | 6 | Female | Quotidian | " | " xv. | None | |
| 5 | 23 | " | " | One | " xx. | " | Paroxysm on 4th day, but none after. |
| 6 | 25 | Male | Tertian | Seven | " xx. | " | |
| 7 | 23 | Female | " | Five | " xx. | " | |
| 8 | 20 | " | " | Three | " xx. | One | |
| 9 | 33 | " | Quotidian | " | " xx. | None | |
| 10 | 19 | " | " | Eight | " xx. | " | With severe neuralgia also. |
| 11 | 22 | Male | Tertian | Four | " xx. | " | |
| 12 | 28 | " | Quotidian | Sixteen | " xx. | " | |
| 13 | 16 | " | Tertian | Three | " xv. | One | |
| 14 | 8 | " | Quotidian | Seven | " x. | None | |
| 15 | 4 | Female | " | Fourteen | " vij. | " | |
| 16 | 6 | " | Tertian | Two | " vij. | " | |
| 17 | 40 | Male | Quotidian | Six | " xx. | " | |
| 18 | 5 | " | Mixed | | " x. | " | |
| 19 | 36 | " | Quotidian | Three | " xx. | Two | Recurred on alternate days. |
| 20 | 11 | " | " | Six | " x. | None | |
| 21 | 8 | " | " | Three | " vij. | " | |
| 22 | 17 | " | Tertian | Four | " xx. | " | |
| 23 | 7 | Female | " | Five | " x. | " | |
| 24 | 60 | Male | " | Eleven | " xx. | One | |
| 25 | 20 | " | Quotidian | Four | " xx. | " | |
| 26 | 30 | " | " | Three | " xx. | None | |

| No. | Age. | Sex. | Type. | Number of paroxysms before treatment. | Quantity of cinchonia administered. | Number of paroxysms after medication. | Remarks. |
|---|---|---|---|---|---|---|---|
| 27 | 40 | Male | Quotidian | Seventy | gr. xx. | None | |
| 28 | 50 | " | Tertian | | " xx. | " | |
| 29 | 55 | " | " | Seven | " xx. | " | |
| 30 | 14 | Female | " | Twenty | " xv. | " | |
| 31 | 28 | Male | Quotidian | | " xx. | One | |
| 32 | 26 | Female | Tertian | Seven | " xv. | " | Then none for 5 days when a single paroxysm occurred. |
| 33 | 2 | " | " | Six | " v. | None | |
| 34 | 4 | Male | " | | " vj. | " | |
| 35 | 32 | " | Quotidian | Six | " xx. | " | |
| 36 | 30 | " | Tertian | Three | " xv. | " | |
| 37 | 8 | " | " | Six | " x. | " | |
| 38 | 6 | Female | Quotidian | Seven | " x. | One | |
| 39 | 30 | Male | " | Two | " xx. | None | |
| 40 | 15 | " | Tertian | Ten | " xv. | " | |
| 41 | 30 | " | Quotidian | Ten | " xx. | One | Severe neuralgia also. |
| 42 | 15 | " | " | Two | " xx. | Two | |
| 43 | 30 | " | Tertian | Three | " xx. | None | |
| 44 | 40 | Female | Mixed | | " xx. | " | Very anæmic. |
| 45 | 35 | Male | Quotidian | Six | " x. | " | |
| 46 | 38 | " | " | Fifteen | " xx. | " | |
| 47 | 50 | " | Tertian | | " xx. | " | Spleen very much enlarged. |
| 48 | 11 | " | " | Three | " x. | " | |
| 49 | 50 | " | Quotidian | Twelve | " xx. | " | |
| 50 | 55 | " | Tertian | Ten | " xx. | " | |
| 51 | 3 | " | Quotidian | Thirteen | " vj. | " | |
| 52 | 18 | Female | Tertian | Two | " xv. | " | |
| 53 | 35 | " | Quotidian | Seventy | " xx. | " | |
| 54 | 40 | " | Mixed | | " xx. | " | |
| 55 | 48 | Male | Tertian | Three | " xx. | " | |
| 56 | 37 | Female | " | Two | " xxx. | " | Paroxysms very severe. |
| 57 | 11 | Male | " | Four | " x. | " | |
| 58 | 15 | " | Quotidian | One | " xx. | " | |
| 59 | 50 | " | Mixed | | " xx. | Two | |
| 60 | 46 | " | Tertian | Seven | " xx. | None | Severe cephalalgia after the cinchonia. |
| 61 | 22 | " | " | Two | " xx. | " | |
| 62 | 18 | " | " | Four | " xx. | " | |
| 63 | 29 | Female | Quotidian | Three | " xx. | " | |
| 64 | 36 | Male | " | Three | " xx. | One | |
| 65 | 9 | " | " | Seven | " xv | None | Hepatic and splenic enlargement. |
| 66 | 39 | Female | Tertian | Six | " xx. | Several | Cinchonia without effect. |
| 67 | 18 | " | Quotidian | Eight | " xv. | None | |
| 68 | 35 | Male | " | | " xx. | One | |
| 69 | 22 | " | Tertian | | " xx. | None | |
| 70 | 22 | " | " | Three | " xx. | " | |
| 71 | 19 | " | Quotidian | Four | " xx. | " | |
| 72 | 50 | " | " | One | " xx. | " | |
| 73 | 46 | Female | Tertian | Four | " xx. | " | |
| 74 | 10 | Male | " | Three | " xv. | One | Chill was a slight one. |
| 75 | 15 | " | " | | " xv. | Three | But none after. |
| 76 | 16 | Female | " | Four | " xv. | None | Cerebral symptoms very decided after the febrifuge. |
| 77 | 58 | Male | Mixed | | " xx. | " | |
| 78 | 15 | " | Quotidian | Seven | " xv. | " | |
| 79 | 13 | " | " | Eight | " x. | " | |
| 80 | 3 | " | Tertian | Six | " x. | One | |
| 81 | 8 | " | " | Nine | " x. | None | |
| 82 | 44 | " | " | Seven | " xx. | " | |
| 83 | 13 | Female | " | Five | " xv. | " | |
| 84 | 58 | Male | " | | " xx. | " | |
| 85 | 48 | Female | Quotidian | Five | " xx. | " | |
| 86 | 8 | " | " | Twelve | " x. | One | |
| 87 | 23 | " | Tertian | Six | " xx. | None | |
| 88 | 28 | Male | Quotidian | Five | " xx. | " | |
| 89 | 15 | " | " | Three | " xv. | One | |
| 90 | 29 | Female | Tertian | " | " xx. | None | Spleen much enlarged. |
| 91 | 5 | " | " | Two | " viij. | " | |
| 92 | 28 | Male | " | Six | " xx. | " | |
| 93 | 35 | " | " | Three | " xx. | " | |
| 94 | 29 | " | " | Nine | " xx. | One | |
| 95 | 55 | " | Quotidian | Twelve | " xx. | None | |
| 96 | 9 | Female | " | Two | " x. | " | |
| 97 | 16 | Male | " | Three | " xv. | " | |
| 98 | 29 | " | Tertian | " | " xx. | " | |
| 99 | 30 | " | Quotidian | " | " xx. | " | |
| 100 | 5 | Female | " | Seven | " x. | One | |

The result thus calculated gives :—

| | |
|---|---|
| Fevers cut short—*i. e.*, which have not presented a single paroxysm from the commencement of medication . . . . . | 79 per cent. |
| Fevers which have presented one paroxysm, but not two after the commencement of medication . . . . . | 15 " |
| Fevers which have presented two, but not more paroxysms . . | 4 " |
| Fevers which have presented three or more paroxysms . . . | 1 " |
| Fevers which cannot be introduced into these categories, but must be regarded as not cut short. . . . . | 1 " |
| | 100 |

It will be perceived that seventy-nine per cent. of the fevers were cut short after the administration of the febrifuge, and in those instances where a single paroxysm afterwards occurred, an examination of the preceding table will show that nine were of a quotidian form, and reference to the full notes in my possession show that in six of these, the use of the antiperiodic was delayed until there was not time to insure the requisite amount being taken before the hour for the occurrence of the chill, and had this not been the case, the first class would have perceptibly increased. In one case only was it found that the sulphate of cinchonia was without effect in sooner or later arresting the progress of the disease.

5. *Relapse.*—In preventing this we did not find cinchonia less efficacious than quinia, and when care was taken to give a certain portion at the time a return might be expected, it was effectually prevented; but as to the precise proportion in which the relapse would have occurred we have no positive means of knowing, since those affected were of the usual class of outdoor patients, with others frequently dependent upon them for support, and living in the outskirts of the city, constantly exposed to malarial emanations, and that all danger of a return might be avoided as much as possible, it was deemed best, under the circumstances, to place them upon the use of tonics, etc., so that any conclusion is quite unreliable upon this point.

*General Deductions.*—In several of the above instances quinia had been used with the effect of arresting the progress of the disease for a time, until the approach of one of the septenary periods, when the paroxysms returned to the number shown in the column, and in more than one case this occurred two or three times, which was not the case after administration of cinchonia. Undue importance must not be attached to this fact, causing us to draw the inference that the relative value of cinchonia is *greater* than that of quinia, but rather to the attention given to recuperation of the general health and abatement of the epidemic influence. But an extensive use of both substances justifies the statement that, in slightly larger doses, cinchonia is equal as an antiperiodic to quinia; so much so, that, in private practice where either can be procured, I order the former with as much assurance of

success as if the latter were used. It is more soluble; tends less to derange the gastric functions; begets less of the malaise; the cephalic symptoms are less violent and enduring, and it is not followed by any special unpleasant effect more than is observed to ensue after use of quinia, and it may be administered in all cases and under all circumstances where this substance is indicated. In saying this, we do not profess to have observed anything new in its mode of use, administration, or the effects arising from it, more than previously detailed by Bally, Bardsley, Pepper, and others who have impartially investigated its properties; but after a more extensive series of experiments, especially in intermittent fever, we can confirm the results obtained by them.

In conclusion, we hope that others will be prompted to extend to it the careful consideration demanded by the subject, and doubt not but all said in its favour will in essential particulars be confirmed.

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ART. IX.—*Miasmatic Typhoid Fever.* By JAMES J. LEVICK, M. D., one of the Physicians of Pennsylvania Hospital. (Extract from a paper read before the Philadelphia County Medical Society, October 14, 1863.)

Without discussing the question of the identity or non-identity of typhus and typhoid fevers, I propose briefly, in this paper, to direct attention to some of those modifications of typhoid fever which are developed by the peculiar antecedents of the individuals thus affected. Reference is not now made to those cases which, from some personal idiosyncrasy, present occasional peculiarities, such as may be seen in the walking cases of this disease, or in those instances in which the cerebral or pulmonic symptoms are so prominent as to mask the ordinary enteric phenomena; but to those in which there is associated with the ordinary cause of the disease a miasmatic or other specific poison, the coexistence of which superadds to the ordinary symptoms of the disease, phenomena of its own production. I do not mean by this to imply that necessarily a hybrid disease is produced; but believe that in some instances, at least, the two diseases run their course together, side by side, to some extent modifying each other, but not inevitably losing the individuality of either.

This doctrine of the coexistence of specific morbid poisons is in direct opposition to the teachings of the earlier writers. John Hunter distinctly states that "no two fevers can exist in the same constitution, nor two local diseases in the same part at the same time." That this opinion of Hunter is erroneous has been clearly demonstrated by Ring, by Marson,

and more recently by Murchison. Marson[1] adduces numerous instances of the simultaneous existence of variola and scarlatina, variola and rubeola. Ring[2] reports the coexistence of smallpox, measles, and hooping-cough; Murchison,[3] numerous instances of smallpox and scarlatina, as well as cases in which typhus and typhoid (or, as he calls it, *pythogenic*) fever coexisted.

Although it has thus been shown that the doctrine of Hunter is untenable, there are yet not a few in our profession who hold that there exists a special antagonism between the typhoid fever and the miasmatic fever poisons. Dr. Murchison[4] quotes numerous authorities on this subject, and refers to the writings of M. Boudin and M. Ancelon, who have largely investigated this subject. Another French writer, M. Thirial,[5] has written a memoir on this antagonism. Murchison very justly maintains that the facts recorded by these writers so far from proving an antagonism rather suggest a similarity of origin of the two fevers, and I am not sure that they do not prove that the one may act as the determining cause of the other. Be this as it may, I feel very confident that the two poisons are often co-operating in the same individual, just as we have cases of miasmatic fever associated with pneumonia, with dysentery, and other diseases.

After having been accustomed for many years to treat the ordinary form of typhoid fever, my attention was arrested in the early part of last year by the occurrence of a series of cases which, while presenting the ordinary phenomena of typhoid fever, had superadded to these many of the symptoms of well-marked miasmatic remittent fever. These cases were characterized by the suddenness of the attack, by the intense pain in the head and back of the neck, by the regularly periodical remission and exacerbation of the fever, and by its amenability to quinia. I have ventured to call such cases *Miasmatic-typhoid fever*, preferring this term to that of *malarial*, for although etymologically the distinction will not hold, yet by common consent in this country the term miasmatic is accepted as belonging to that form of poison which is believed to be due to paludal exhalations; while the term *malaria* (*bad air*) applies with especial propriety to what is now regarded by some English authorities as the specific cause of typhoid, or, as they call it, pythogenic fever.

In some remarks made at the Pennsylvania Hospital, June 7th, 1862,

[1] Marson on the Coexistence of Variola and Scarlatina. (Med.-Chir. Trans., vol. xxx. p. 121.)

[2] See Williams on Morbid Poisons, vol. i. p. 211.

[3] Murchison on the Coexistence of Specific Morbid Poisons. (Brit. and For. Med.-Chir. Review, vol. xxvi. p. 178.)

[4] Murchison on Continued Fever, p. 421, London, 1862.

[5] De l'antagonisme entre la fièvre typhoide et les maladies graves en général, &c., par le Docteur H. Thirial, Paris, 1855.

which were published at that time, I gave a detailed clinical account of one group of these cases. I shall, therefore, content myself here by giving, in a condensed form, a summary of the observations then made. That these were cases of typhoid fever was shown by the fact that in every instance, even in the mildest, was found the characteristic eruption. That there was disease of Peyer's glands was inferable from the fact that diarrhœa was present in every case, or was readily induced by small doses of cathartic medicine, a teaspoonful of castor oil producing five alvine passages.

In some of these cases the attack was gradual, a sort of imperfectly developed stage existing for a week or longer; the patient able to move about, but with a little diarrhœa; pretty well in the morning, but with severe headache and some fever every evening, with restless, uncomfortable nights. In other instances the attack began suddenly, with a chilliness and intense "splitting" pain in the head, unlike the headache of typhoid fever, which is dull and heavy. A slight cough, with the usual bronchitic râles, was noticed in nearly all the cases referred to. The remittent character of some of these cases in their forming stages has been already alluded to; in all of them the paroxysmal character was strongly developed, a marked exacerbation occurring in the latter part of the day or evening, the fever passing off towards morning, and the apyrexia ushered in with as profuse sweating as is witnessed in the most decided cases of miasmatic fever. I am well aware that a partial subsidence occurs in ordinary typhoid fever, but the exacerbation and remission of the miasmatic typhoid fever bear no resemblance to this temporary subsidence in "continued fever." The severe headache, which has already been noticed, was one of the most constant symptoms—described by the patient as "splitting," "battering," and the like; it appears to have been one of the chief sources of his discomfort, though generally associated with it were intense pains in the back of the neck and the muscles between the shoulders, and in some instances universal achings. The tongue was generally covered with a loose yellowish-white fur, and in all the cases to which I now refer did not present the dry, brown condition which is so often seen in the advanced stages of typhoid fever. The pulse, though in two instances reaching 120, was rarely above 90, and in all was soft, and in none alarmingly feeble. There was in these cases no great tympanites. The mental condition of these patients was unlike that of ordinary typhoid fever, in being free from the dulness or hebetude which usually attends this disease. Though indisposed to any active mental exertion, all these patients retained their interest in the events transpiring around them, and gave intelligent responses to questions put to them. In none of them was there well-marked delirium. These were the phenomena which presented themselves in all the cases of miasmatic-typhoid fever which were unassociated with the graver complications hereafter to be alluded to. Merely considering the facts which have been mentioned, we might readily infer that this exposure to the double poison of miasmatic and

typhoid fevers had developed a new disease, a *tertium quid*, as it were, in which the elementary constituents were so intimately united as to have developed a new and distinct compound body, analogous to what occurs in chemical combinations. But it is an interesting fact in this connection, that the administration of the usual remedy in remittent fever, sulphate of quinia, while it always promptly relieved and arrested the miasmatic fever element of the disease, did not promptly cure the patient; it mitigated the symptoms, but convalescence did not begin for a week or more; the enteric fever element continued, and this disease ran its course. But what was also highly interesting was the fact that the addition of the miasmatic fever element did not render the disease more serious than typhoid fever in its ordinary form. On the contrary, either this complication, or the means taken to combat it, seemed to render the disorder more tractable and less fatal. It should before this have been mentioned that all these illustrations of miasmatic typhoid fever occurred among soldiers or sailors engaged in our national service —sailors who had been attached to vessels carrying troops to Fortress Monroe and the coast of North Carolina; soldiers in the army of the Potomac, before and at the beginning of the Peninsular campaign.[1]

Such was the character of the cases of miasmatic typhoid fever coming under notice in the spring and early summer months of last year. On the 7th of July, 1862, there arrived at the Pennsylvania Hospital, direct from

[1] More recently my attention has been attracted to another interesting fact in connection with this form of disease, which may be here briefly alluded to. During the late invasion of our State, it is well known that large numbers of patriotic young men entered the ranks of the State militia, and endured the hardships of a brief but victorious campaign. The health of these soldiers during their active service, for the most part, was excellent; but a week or more *after their return* very many of them were seized with this fever, and in some I am told it proved fatal. A more remarkable illustration of the same occurred to the members of Hasting's Battery, of this city. These young men offered their services to the President in the summer of 1862 for one year, which were accepted. They were attached to the army of the Potomac, and shared its varied fortunes, hardships, and exposures. At the expiration of the twelve months they were mustered out of service. Up to this time the health of the regiment had been excellent. But *on their return to their homes* in Philadelphia numbers of them were seized with a modified form of typhoid fever, which, though grave, has I believe in no instance proved fatal. Andral, in his earliest account of typhoid fever, makes mention of the fact that medical students coming to Paris for the first time were very liable to be attacked within a few weeks of their arrival with typhoid fever. The same has been noticed in London. Every one who has had much to do with students of medicine coming to our city from North Carolina and other miasmatic regions, well knows that nothing was more common than for them to be attacked a fortnight or sooner after arrival here with a severe form of bilious remittent fever, and this too after having lived safely all their lives long in the midst of the miasmatic poison. It is at least an interesting coincidence that the same fact obtains in the form of fever which we are now considering.

the army of the Potomac, twenty-seven cases of fever, presenting very different phenomena. These were men who had accompanied the army in its march along the Peninsula; had lain before Yorktown, had toiled in the swamps of the Chickahominy, and either had been active participants in the seven days' fight, or had been in the hospitals at the White House and elsewhere in this vicinity. They represented almost all forms of typhoid fever. Some were cases well described in my previous remarks, though of a more severe type. Others were instances in which, with the ordinary phenomena of typhoid fever, the *tache*, diarrhœa, &c., were associated those of pernicious congestive remittent fever, as evinced by the shrivelled washerwoman's fingers, copious serous discharges, not unlike those of Asiatic cholera, the colliquative sweats, and other symptoms of extreme exhaustion. Still another class were individuals in whom, to the ordinary typhoid fever symptoms, were added those of great blood poisoning, cases presenting the true typhoid, *i. e.*, typhus-like symptoms, as shown by extreme emaciation, excessive nervous tremors, delirium, sordes, excessive irritability of stomach and vomiting of a dark greenish fluid, diarrhœa, involuntary discharges from the bowels, petechiæ, vibices, sloughing bed sores, hemorrhage from the bowels, and in a large number of cases ending in death. The contrast between the mortality of ordinary typhoid fever, and as thus modified, was strikingly impressed on the writer's mind by the fact that of twenty-nine cases of typhoid fever treated by him during the months of April, May, and June, uncomplicated, except by those lesions which usually occur, all recovered; while of twenty-seven cases of typhoid fever brought under his care from the army, in which the complication existed of miasmatic poison, the scorbutic diathesis, the typhous condition, nine, *i. e.*, one-third, died—four of the number not living long enough to be put on any regular treatment.

Indeed it is difficult to paint a more melancholy picture than that which these poor creatures exhibited. Brought in crowded transports, they arrived in our city during the intense heat of July, and thence over the rough stones were conveyed to our hospital. With constitutions broken down by the life they had recently led, necessarily deprived of the kind of food to which their previous lives had accustomed them, drinking the water of the James, or the viler water of the Chickahominy, wearing both by day and night the same apparel; ill in crowded hospitals, to be transferred to more crowded transport ships—nothing was wanting to fill up the catalogue of causes which result in the development of genuine typhus fever. And yet I cannot recall one case in which the true typhus fever rash exhibited itself, nor was there, so far as I could learn, a single instance in which the fever was communicated by contagion to any one in the hospital. Petechiæ, passive hemorrhages, there were in melancholy abundance, but not the true rubeoloid rash. And yet, that the condition of the blood was very much that of true typhus, there can be no doubt; the injected eye, the acute delirium, or

the profound coma, all corresponded to this, as well as did the other phenomena before described. There was, indeed, in these cases a third morbific agent—a scorbutic or typhous condition of the blood associated with the true typhoid and miasmatic poisons.

Those who are familiar with the celebrated Walcheren fever, cannot fail to be struck with the remarkable correspondence, I had almost said identity, existing between this and the fever of the Chickahominy. This ill-starred expedition, the memory of which still casts its dark shadow over many an English home, left England 40,000 strong on the 28th of July, 1809, and sailed for the Scheldt.[1] The soldiers, exposed to the miasm of these flat, marshy countries, became affected to a fearful extent with a violent form of fever. Thousands of them returned to England broken down in health. A part of the army remained to garrison the island of Walcheren, "an island of all others the most unhealthy." An idea may be formed of the unhealthiness of the soldiers, when it is stated that on the 14th of September, of 15,000 men in Walcheren, 10,000 were actually sick, the deaths averaging 20 to 30 per day. One week's return gave five officers and 375 men dead (DAVIS' *View of the Fever of Walcheren*, London, 1810, page 15). The type of this fever has generally been regarded as that of the miasmatic remittent, but that in very many instances it was really that of the miasmatic typhoid fever in its worst form, I think there can be no doubt. This is confirmed by the statement of Dawson, who has left us an interesting account of the cases coming under his care. He says of it: "The fevers were of the continued and intermittent kind, and in every case there was an unaccountable disposition in the one to degenerate into the other, and it was a circumstance which very frequently took place."[2] This writer gives, among the symptoms attending the Walcheren fever, in the severe forms, a brown and furred tongue, a convulsive tremor of the body, great fulness of the abdomen with tenderness on pressure, violent and constant pain in the head, and delirium, pulmonary irritation, diarrhœa, the sudden occurrence (doubtless from perforation) of fatal peritonitis. After death, it is recorded by Davis and by Dawson, among other lesions, that "in the ileum and jejunum were little ragged ulcers, excavated in the middle, resembling chancres, or one large, or a succession of small ulcers spreading wide upon and deep into the coats of the intestine." Both Davis and Dawson note tumefaction, and in some instances suppuration of the mesenteric glands as a not infrequent pathological condition of Walcheren fever. This, it will be remembered, was more than twenty years before Louis had pointed out these as the post-mortem lesions of typhoid fever. These writers fall into the error of treating of diarrhœa and dysentery as distinct diseases in these cases, instead of regarding each of them, and especially the former,

[1] This was exclusive of a large naval force attached to the expedition.

[2] Observations on the Walcheren Diseases, &c. By G. P. Dawson, London, 1810.

as in many instances but an attendant of the general febrile disorder. This mistake occurs in practice much more frequently than is suspected. Patients were often sent to us as cases of "diarrhœa" which, upon careful inspection of the abdomen, were readily recognized as cases of typhoid fever with its characteristic eruption.

I trust, on the other hand, not to be understood by this to assert that every case of diarrhœa with febrile symptoms, occurring under the circumstances I have related, was an instance of typhoid fever. That this was not the case was proved by the phenomena during life, and the appearances after death. In the few autopsies made at the Pennsylvania Hospital, the cases recognized as typhoid fever presented the anatomical lesions usually found in this disease, viz., enlargement of Peyer's glands, increasing in thickness lower down the bowel, the lowest in various degrees of ulceration, the solitary glands enlarged, as were also those of the mesentery, the spleen softened, and the liver in some instances engorged. This corresponds with the description given me by my friend, Professor Leidy, whose investigations as Pathologist to the West Philadelphia Military Hospital were of the most extensive and scientific character. But in cases of Chickahominy diarrhœa, as it was called, without the *tache* of typhoid fever, a different set of post-mortem appearances presented. In these, he tells me, were found patches of inflammation in the ileum; while in the glands of Peyer and the solitary glands there was invariably found a deposit of a black colour, but no ulceration. There was inflammation of the caput coli and sigmoid flexure, but none of the transverse colon. In one-fourth of these cases there was *discoloration* of the supra-renal capsules. The spleen was so impoverished of blood that its intimate structure could be more readily studied than usual. The lungs and heart were in appearance natural; there was no diminution in the relative proportion of the white and red corpuscles of the blood, but a great diminution or alteration in the whole amount.

In concluding these remarks on some of the modifications of typhoid fever, I wish it to be distinctly understood that no claim to originality is made in thus recognizing this association of the two poisons in the disease just treated of. I am well aware that its occasional existence has been noticed by our own writers, and its frequent concurrence by physicians in our Southern and Western States, where the elements for its development are more constant than they are with us. Dr. Drake, in his work on the Principal Diseases of the Interior Valley of North America—a monument of medical industry—describes what he calls *remitto-typhus*, not recognizing the distinction between typhus and typhoid fevers, and mentions the interesting fact, if it be such, that the union of the miasmatic and typhus fevers occurs only between the latter and the remittent, not with the intermittent. He adds what seems to conflict with this statement, but what my own observations already reported confirm, that these poisons combine in all

proportions, and that as the elements vary in their proportions, so the phenomena must vary. So, too, Dr. Wooten, of Lownsboro', Alabama, writes to Dr. Bartlett many years ago, "I have often seen typhoid fever and remittent existing together, and I have cured the paroxysmal exacerbation whilst the disease essential to typhoid fever continued." Numerous other authorities might be quoted. My own observations, however, were made at the bedside, and recorded before these two descriptions came under my notice. The especial object of this paper is to call attention to the fact that this coexistence is not merely a rare phenomenon, but one of frequent occurrence. While numerous illustrations in groups of cases might be adduced as confirmatory of this fact, it is its sporadic occurrence which it is most important we should bear in mind. When the same symptoms attack large numbers of people, our attention is arrested, and we are better prepared to encounter them; the single individual cases steal quietly upon us, and often find us off our guard. Although the instances here adduced have all been from among our soldiers, examples have recently occurred in private practice of the same facts. There can be no doubt that there exists at the present time in our city and vicinity a strongly developed miasmatic influence. It shows itself not merely in its familiar garb of intermittent and remittent fevers, but attaches itself to almost every other disease, if not lending its full livery, at least casting its mantle upon them. Cases even of cholera infantum have been noticed this autumn as thus disguised. So prominent are the miasmatic fever symptoms, and so amenable to quinia, that unless we are on the watch for the typhoid fever element it will for a time escape notice. In the instances under the writer's care during the last month there has been no decided diarrhœa, no especial sensitiveness of the bowels until discovered by the therapeutic test. In these cases, too, the mind has been bright and active, with none of the hebetude of typhoid fever. These cases have taught him the lesson not to be led astray in his diagnosis of fever by the occurrence of well-marked exacerbations and remissions, nor to suppose that a fever is purely miasmatic because the grave symptoms disappear under the use of quinia, but rather in all fevers, other than the ephemera, to search carefully, day after day, for the spots of typhoid fever; to sedulously avoid the use of all active purgatives, and in every instance, during the first week or two, to keep his patients exclusively on the use of liquid food, lest, by the sudden occurrence of fatal perforation of the intestine, when it is too late he may be aroused to a painful consciousness of the fact that he has been treating, not a case of simple remittent, but of *Miasmatic typhoid fever.*

Oct. 14th, 1863.

ART. X.—*Loss (Hysterical) of Speech and Hearing successfully treated by the Inhalation of Ether.* Reported by JAMES H. HUTCHINSON, M. D., one of the Physicians to the Episcopal Hospital.

C. C., a German girl, aged 20 years, was admitted to the hospital September 22d, on account of entire loss of speech, which had occurred ten days previously. Complete deafness supervened two weeks after her admission.

The history of the case is as follows:—

She had always had good health up to two and a half years ago, when she was about to leave Germany for this country. At that time she had a violent quarrel with her fellow travellers, which gave rise to a hemorrhage from the lungs. During the voyage she had several convulsions; but upon her arrival in this country she was sufficiently well to take the place of cook in a private family, and continued in good health, with short interruptions, up to September of last year.

I found her in the wards when I took charge of them at the beginning of the year. I learned that she had had but few convulsions while in the hospital, and that the usual remedies had been tried without relieving her condition. Electricity, the various tonics, nux vomica, and, lastly, sulphate of anilin, had all been resorted to without benefit. During all this time her only means of communicating with others was by means of a slate.

I was anxious to discover whether the loss of speech and of hearing was in any degree feigned, and with that view directed the resident physician to administer ether to her by inhalation, believing that if such were the case she would utter sounds, if not words, as she came under the influence of the anæsthetic. The result, however, was different from what I had expected.

The ether threw her into a slight convulsion, from which she soon recovered, having entirely regained her hearing.

Two days subsequently I directed the experiment to be repeated. Upon recovering her consciousness she was able to say "mamma," and to make various inarticulate sounds.

She was a third time (three days later) placed under the influence of ether, with the following curious result: that of recovery of speech and loss of hearing.

A fourth etherization produced no immediate result; but in the course of a few days she was able first to hear loud noises, and later to understand what was said when spoken in a loud tone of voice. The improvement after this was very rapid, and by the middle of January her recovery was complete.

She was retained until the beginning of February for observation; but as she continued quite well she was discharged at this time at her own request.

Her joy at her recovery may be well imagined, as all hope had been abandoned by herself and friends, by whom application had been made to the managers of the deaf and dumb asylum for her admission to that institution.

ART. XI.—*Cerebro-Spinal Meningitis.* By A. P. MORRILL, M. D., of Memphis, Tenn.

THE disease to which this name has been given made its appearance among the negroes brought to Memphis by the Federal army, in the fall of 1862, and continued to prevail among them during all the succeeding winter, but to what extent, and with what amount of fatality, I am unable to say, as no report has been made of it by those having them in charge. The only cases I saw were among the negroes permitted to remain in the city, many of whom I visited, and for several of whom I prescribed.

The symptoms of the disease were mostly those mentioned by Dr. Condie in his edition of *Barlow's Practice;* but in some cases the tetanic symptoms were not severe. The worst cases, and the largest number, were among youths of both sexes, from ten to fourteen years of age, although many adults were attacked, and some very old negroes. I saw only one case among the white population, which was that of a boy, fourteen years old, a patient of Dr. Pittman's, whose spine was bent backwards in a constantly increasing curve for ten or twelve days, when he died.

Various plans of treatment were adopted, but I heard of no case of recovery. Indeed, the negroes were badly cared for, and they received only a small amount of medical attention. I saw several cases in which quinia was freely given; others were treated mostly with mercurials; some were cupped and blistered; purgatives, antimonials, and excitants were variously employed, and opiates were very freely used. Death ensued in from three to fifteen days.

My attention was called to the case of a mulatto girl, about twelve years old, who had been suffering with the disease for four or five days. Her head was set firmly back, and her whole spine was curved and rigid. Her skin and extremities were cold, the pupils of her eyes dilated, her pulse 140, and feeble. She was delirious and exceedingly restless, and so insensible to the effect of heat that it had become necessary to employ force to keep her out of the fire. The treatment had consisted in the use of purgatives, opiates, sinapisms, with a blister along the spinal column. Believing the disease to be one of disordered innervation, I prescribed tincture of aconite, in such doses as to produce some degree of toxical effect, repeated every three hours; and in twenty-four hours she was greatly relieved; her senses had returned; her spine was less curved and rigid; she was able to sit up; and she showed signs of returning appetite. The continuance of this remedy for three or four days, with an occasional dose of calomel, gave entire relief, and I ceased to visit the patient. But ten days subsequently she suffered a relapse, and died without medical treatment.

The succeeding winter, 1863–4, the disease appeared among the blacks

again, and a case occurring in my own house enabled me to test the efficacy of aconite once more. The subject of this was a mulatto boy, twelve years old, who came to me one morning with his head set firmly back and drawn a little to one side, his pulse much quickened, his tongue heavily coated, and complaining of violent pain in his legs. I gave him a scruple of calomel, and put him on a course of aconite in full doses, repeated every three hours. The pulse was soon reduced to 70, and the bowels well purged. Calomel in purgative doses was given daily, and he improved slowly until about the twelfth day, when I found him entirely relieved, and he took no medicine afterward. The only external application made was a liniment made strong with oil of amber and tincture of aconite.

The effect of aconite in these cases is some evidence, perhaps, that this is a disease of nervous irritation, requiring the free use of narcotic remedies. It may be that other articles of this class may answer a better purpose, but I am well convinced that opiates are injurious. The digestive organs are always greatly disordered, with impaired and vitiated secretions; and hence the necessity for the use of calomel. I doubt whether benefit has been derived in any case from bloodletting, either general or local.

Although the disease has been confined mostly to negroes, in Memphis and the vicinity, in some other localities it is said to have prevailed principally among the white population. Whether affecting the one or the other, it must be ranked among the most fatal diseases, and any successful practice in its treatment is of importance. This is my apology for making this report.

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ART. XII.—*Case of Pott's Abscess of the Brain—Trephining—Necrosis and Removal of the Right Parietal and part of the Frontal Bones—Recovery.* Reported by H. RAPHAEL, M. D., House Surgeon, Bellevue Hospital.

THOMAS LAUDER, æt. 24, single, born in England, ship's steward, was always temperate, enjoyed good health, and presented no symptoms of syphilitic or any other specific disease. On the 12th of Dec., 1862, while partaking in an affray, he was struck on the head with the edge of a shovel, which stunned him for a time and produced a lacerated wound of the scalp, about two inches in length, over the left occipito-parietal suture. For this he was treated at the N. Y. Hospital, and was soon discharged, cured. In a few days intense headache supervened, and the patient was admitted to this hospital on the 24th of Dec., 1862, suffering from severe pain in the head and intermittent delirium.

The symptoms were relieved by the use of leeches to the temples and blisters at the nape of the neck. The relief, however, was only temporary, and the patient grew worse daily. Vomiting and intolerance of light and

sound came on; these became worse, and on Dec. 31st periods of unconscious stupor began to alternate with delirium; each of these symptoms lasting for about an hour. As yet sensation was not abolished.

*Jan.* 2. The attending periods of stupor deepened into coma and encroached upon the periods of the delirium. Pulse 130 per minute, full and strong; pupils contracted; skin hot and dry. A large puffy tumour of the scalp was now developed, dissecting up the entire scalp from the calvarium and crepitating to the feel, being emphysematous. At 8 P. M. to-day, Dr. Stephen Smith made a free incision, crucial, into the scalp, and applied a Gault's trephine on the right parietal bone close to the occipito-parietal suture. A large quantity of fetid and gaseous pus escaped from beneath the scalp. There was some superficial necrosis of the bone, and on removing the disk of bone with the trephine a greenish, dirty-looking pus, about half an ounce in quantity, oozed out from between the meninges and cranium. The patient was conscious at the time of the operation, and complained loudly of the pain inflicted on him. Several ounces of blood were lost during the operation, and his pulse fell from 130 to 85 beats per minute. The coma and delirium disappeared, and the patient expressed himself relieved, and slept some during the night. Cold water dressing was applied to the head.

3*d.* Coma reappeared to-day; this time it is attended with puffing of the cheeks during expirations. Pulse 100. Dr. Smith again trephined the right parietal bone close to the former trephining, but no pus was found. The pulsation of the brain could be easily seen through the openings in the cranium.

4*th.* Ordered a cathartic of ol. tiglii to be given, which operated freely. The paralysis of the left side has disappeared to-day; otherwise there is no change.

5*th.* Patient experiences some difficulty in deglutition, compelling him to partake of nourishment very sparingly.

6*th.* The difficulty at deglutition has disappeared, otherwise he is about the same.

7*th.* Patient was attacked to-day with delirium and stupor, which alternate; the paralysis which had disappeared after the trephining has again affected the left side; complains also of headache. Ordered ol. tiglii, gtt. ij in ol. ricini, ℥j. This produced several watery evacuations.

8*th.* The delirium and stupor have subsided, has but little headache, and says he is much better.

10*th.* Patient is considerably worse to-day than he has been for the last two days. Passed a sleepless night, is now delirious, and his pulse is 105. Ordered pot. iod., gr. x, three times daily, and tr. aconiti rad., gtt. ij every hour.

11*th.* Has slept the major part of last night. Pulse 85, and says he is much better.

12*th.* Patient is decidedly better to-day than he has been for the last few days. The paralyzed arm and leg have regained their motive power; sensation is perfect over the whole body; answers questions coherently; appetite fair, and pulse 84.

13*th.* Discovered a puffy tumour on the right temple extending over the right half of the forehead down to the eyebrow, and behind to the mastoid process. The contents of this tumour were similar in character to that of the primary abscess of the scalp—containing pus and air.

15*th*. Another collection of matter formed over the centre of the forehead. A large quantity of pus and air was evacuated from the abscess.

16*th*. No change.

17*th*. Had a very bad night; was sleepless and moaned constantly; and this morning found another fluctuating tumour over the forehead. The evacuation of this abscess gave instant relief.

19*th*. Patient is about the same. The pulse, however, is full and strong, and 106 per minute, for which the aconite was again prescribed till the pulse was reduced to 80.

20*th*. Much improved to-day. Sat up in bed for some time. Appetite good; pulse 80.

22*d*. Patient's condition is not as good to-day as it was at last record. Pulse 114; complains of headache, and is drowsy. Ordered three leeches to each temple, a brisk cathartic, and the aconite in two drop doses every hour.

23*d*. Much better. The cephalalgia is less intense; the drowsiness is gone; pulse 88.

24*th*. No change.

25*th*. Febrile symptoms have again developed themselves. Pulse 112, cephalalgia, with hemiopia. These symptoms again subsided under a moderately antiphlogistic treatment.

27*th*. No change in the patient's condition to-day.

28*th*. The patient is to-day improving.

31*st*. He is somewhat worse to-day; is restless and irritable. Pulse 120. Ordered a cathartic with the other adjuvants, and nothing stimulating was allowed.

*Feb*. 1. Patient is about the same as yesterday.

3*d*. At the suggestion of Dr. Smith the exts. of belladonna and hyoscyamus, gr. ss of the former to gr. ij of the latter, were ordered three times daily.

4*th*. Patient complains of dryness of the throat. Pupils are dilated to such an extent that he is unable to see anything. Suspended the use of belladonna and gave the extract of hyoscyamus alone. Opened a small abscess on the forehead over the right eye.

7*th*. Patient informs me that he had a chill during the night, and felt very cold, and that his skin was burning hot afterwards. His pulse now is 135; pupils still dilated; but his throat is less affected than it was. Ordered a turpentine enemata and the tr. aconite, gtt. j, every hour.

8*th*. Better to-day; pulse 85; no headache; passed a good night, and is bright and cheerful.

9*th*. Patient's pulse is remarkably weak and rapid to-day. Ventured to give him stimulus, about ℥ss every three hours, and as a tonic the preparation of iron; also pot. chlor. ℥iij, tr. cinchona C, syr. cort. aurant., ää ℥ij, aqua ℥iv, a tablespoonful three times daily.

28*th*. Granulations have sprung up on the dura mater over the trephined spaces, and as these reach the level of the calvarium they join with the granulations from the edges of the divided scalp.

*March* 5. Again complains of frontal headache. Pupils dilated; pulse normal; skin moist and cool. Ordered an enemata of ol. terebinth. and pot. iod., gr. x, three times daily.

10*th*. Has had no headache during the last three days, but complained again to-day of it. Relieved by the same remedies as on former occasions.

18*th*. Nothing of note occurred since last record. At 6 P. M. to-day was

called to see patient, and found him labouring in convulsions, epileptiform in character. Extremities contracted; pupils enormously dilated, and puffing of the cheeks at expirations. The patient was put on low diet, his stimulus was cut off. Pot. iod., gr. v, three times a day was ordered.

19*th*. Slept well during the night, and was very comfortable this morning, but after eating a hearty breakfast he had another attack; this one, however, was not near so severe as the first.

30*th*. Patient was free from these attacks till last night, when he had several slight convulsions, which left him partially paralyzed on the left side. Ordered a pill containing ext. belladonna, gr. $\frac{1}{4}$, ext. hyoscyam., gr. j, three times a day.

*April* 4. Had again several convulsions during the night.

5*th*. These attacks again recurred to-day. Ordered a two gr. pill of zinci valerianati three times a day.

*May* 1. Has been free from convulsions since last date, and suffered from several fits to-day; these passed off, leaving no bad effects behind.

3*d*. These convulsions continue to recur, and are augmenting both in frequency and severity. Ordered ferri carb., gr. x, three times daily.

14*th*. Has been free from the convulsions till to-day, when they again recurred. This remedy seems to have lost its virtue (if it had any) in suppressing these convulsions. Some small loose pieces of bone were removed from the skull, not, however, without some force.

30*th*. Was free from the convulsions till to-day, six P. M. The right parietal bone is now detached from its fellow, but is still adhering to the frontal and temporal bones. The handle of a scalpel is easily passed between the parietal bone and dura mater. Attention is paid to his bowels, which are moved daily by a mixture of pot. bitart. and mag. sulph., which seems to mitigate the severity of the convulsions.

*July* 20. Is still under the same course of treatment. The saline mixture, and the pills of valerianate of zinc alternated with other antispasmodic remedies. He is up and about in the ward, and takes out-door exercise. His general condition is much improved. Yesterday he ventured to go out in the city, and, although the weather was extremely warm, he suffered no bad effects from it. The parietal bone is loose and movable, but not yet ready to be taken away.

*Aug.* 3*d*. The treatment in this case remained the same as at last record. This morning I again moved the bone to and fro, as usual, for the purpose of detaching it, when a crackling of bone indicated that the last osseous attachments had been broken, and, after a little manipulation, I was enabled to remove the whole portion entirely. The fragment consists of a portion of the frontal and the whole parietal bone. The frontal part is about half of the bone, separating at a line where the hairy part of the scalp commences. The whole fragment measures at its narrowest (transverse) diameter five inches, at its shortest (antero-posterior) diameter eight inches, and in circumference nineteen inches. The edges of the bone have become much disintegrated by the action of the surrounding pus. Some pus and blood flowed from the surface of the dura mater, when the bone was removed. The dura mater has a thick layer of granulations on its surface, and cicatrization has already begun where the bone was deficient. A varicose condition of the veins in the granulations was observed at various points; where they were ruptured or pricked with a lancet, blood oozed out and the part collapsed. Cold water dressing was applied to the head, and patient was ordered to remain in bed. The scalp covering the necrosed

bone was, since the first incision and trephining, allowed to take its own course. The tendinous portion of the occipito-frontalis being divided, the muscle contracted, and curled up the detached scalp on itself, so that the hair surface pressed on the dura mater. In consequence of these contractions, a large surface of the dura mater was uncovered, having only the layer of granulations, already spoken of, for its protection. By dividing the adhesions the contracted part had formed with itself, and spreading it on the surface of the dura mater, the exposed surface of that membrane was reduced from five by eight inches to three by four inches. On account of the hemorrhage and pain attending this operation (the patient refusing to take an anæsthetic), only one flap at a time was operated on (the anterior), and an interval of several days was allowed to pass to give the patient time to recover from the exhaustion attending the operation before the posterior flap was operated on. In spite of these operations, the dura mater has a space of three by four inches remaining exposed, having neither bone nor scalp to cover it. The granulations of the dura mater are rapidly cicatrizing, and the patient, unwilling to remain any longer in this institution, returned to London,[1] his native place, on the 12th of September, having been an inmate of this hospital since December, 1862.

The only bad effects the patient suffered from the result of this grave disease at the time he left this hospital, were a partial contraction of the fingers of the left hand and presbyopy, confined to the left eye *only*.

*Remarks.*—On comparing the portion of bone removed from Thomas Lauder with a skull of about the same size and age as the patient, I find that the parietal bone has separated at the sutures, connecting it with the bones by which it is surrounded. At the sagittal suture from its fellow at the lambdoidal with the occipital, and at the squamous suture with the squamous portion of the temporal bone. From this suture an irregular line of separation is continued forward to a point over the centre of the right orbit, and striking off almost at a right angle shooting upwards, backwards, and outwards (inclining a little to the left) strikes the fronto-parietal, or coronal suture of the left side an inch and a quarter from the sagittal suture. The frontal bone is thus divided in two unequal parts. The separated portion has its base at its junction with the greater wing of the sphenoid bone, its lesser base at its junction with the parietal bone. The right lower angle of the necrosed frontal bone, if continued downwards, would strike the upper margin of the right orbit in the centre. The ossa Wormiana, found in these sutures, have all macerated and come away with the discharge. The larger ones were removed with a forceps when they loosened. The frontal portion is adherent to the parietal, and, although somewhat movable at the coronal suture, they cannot be separated without fracturing some of the serrations forming the suture. The length of the frontal portion is four inches, width two and a half inches, but on account of its irregular shape it is difficult to give the very exact measures. Both bones together

[1] It is to be hoped that the surgeon under whose care this patient may come, will report the further history of the case.

measure eight inches in length, and varying from four, four and a half, to five inches in width. From the length of time the bone was macerated in the discharges, it has its outer table exfoliated in several spots; at other points both inner and outer tables have been corroded, producing small irregular holes along the margins of the bone.

BELLEVUE HOSPITAL, Sept., 1863.

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ART. XIII.—*Two successful Cases of Ovariotomy performed by* A. DUNLAP, M. D., of Springfield, Ohio. Reported by J. C. REEVE, M. D., Dayton, Ohio.

CASE I. Julia C. first came under my observation during the summer of 1861. She was then 19 years of age, unmarried, small stature, and delicate appearance; had never suffered any serious illness, and presented no marks of disease, except enlargement of the abdomen. Not being willing to submit to any treatment proposed, I did not see her again until Sept. 17th, when I took notes of the history of her case, and of her conditions.

Four years before she menstruated once, and once only; at intervals of about three weeks, ever since then, she has had symptoms indicating an effort at menstruation, but no discharge has appeared. About four years ago swelling of the abdomen commenced, but she cannot say upon which side it first appeared; this swelling has steadily increased up to the present time, when it interferes seriously with respiration, and calls imperatively for relief. The abdomen measures fifty-two inches in circumference; the lower ribs are widely separated by the upward pressure of the tumour, exaggerating very much the cone shape of the thorax. Fluctuation is readily perceived in every direction; percussion gives a dull sound everywhere, except in the right lumbar region, and in every position of the patient; the tumour moves from side to side as she turns, as much as possible with the parietes so distended. A vaginal examination showed the uterus to be very much drawn up, so much so as to make it impossible to reach the os uteri; no fluctuation could be felt in the vagina, upon tapping the interior of the abdomen. The appetite was good, bowels regular, and no difficulty experienced in urinating.

On the 21st of Sept., having in the meantime carefully re-examined, and succeeded in reaching the os uteri, I tapped her by the usual method, through the linea alba. Thirty pints of fluid were removed, specific gravity 1.018, dark brown in colour, and presenting innumerable shining particles of matter (cholesterine); upon the addition of nitric acid, two-thirds of its bulk became solid. The removal of this fluid allowed a mass of cysts to be felt in the left iliac region as large as a child's head. She recovered from this operation speedily, and without having presented any serious symptoms.

During the following spring she again called upon me for relief from the distension, the tumour being larger than before. The operation of ovariotomy had been previously presented to her, but was then rejected; it was now again presented, and all the probabilities and possibilities candidly stated, and compared with the inevitable result of repeated tapping. Hav-

ing been examined by Dr. A. DUNLAP, of Springfield, Ohio, and her case declared a favourable one for the operation, she decided to submit to it, and it was performed by that gentleman on the 2d of April, 1862.

An incision some four or five inches long was first made in the linea alba, between the umbilicus and pubis; through this a large cyst presented itself, which was opened, and its contents allowed to escape; the hand was then carried around the remainder of the tumour, and numerous adhesions were peeled off; towards the region of the liver, however, under the lower ribs, the adhesions were extensive and extremely firm, so much so as to necessitate the extension of the incision upwards, some six or eight inches more, and the employment of the knife for their separation, during which process another of the cysts was opened; several ligatures were required here to restrain the hemorrhage from divided vessels. The pedicle of the tumour, which was formed from the left ovary, was then transfixed with a needle, carrying a ligature made of several strands of heavy silk, not twisted together; each half was tied separately and tightly, and one side of the ligature then carried once around the whole stalk, and again tied, when the tumour was removed. After giving sufficient, and, indeed, ample time for all oozing to cease, and after careful sponging of the abdominal cavity, the incision was closed by eight or ten interrupted sutures, strips of adhesive plaster were laid across between them, and a many-tailed bandage drawn around, and secured over the whole.

The patient was placed under the influence of chloroform at the beginning of the operation, and during most of the time she was fully under its influence; towards the latter part of it, the time occupied being about forty minutes, she was in a semi-conscious state, and complained a good deal. At its close she was in a far more favourable condition than could have been expected by any one who saw her but a few minutes before, her abdomen laid entirely open, its cavity, with all the viscera, fully exposed, and the effect of such incisions heightened by the immense mass removed, and by the distension outwards and upwards of the lower ribs.

The fluid part of the tumour weighed twenty-nine pounds, the solid part and assemblage of cysts unopened, thirty-five pounds; total, sixty-four pounds.

I append notes of her condition during a few days. 2.30 P. M., three hours after the operation, pulse 96, catheter passed, urine f℥viij; 5 P. M. pulse 100, catheter f℥vj; 9 P. M., pulse 108, catheter f℥iv. April 3d, 12.45 A. M., pulse 120, catheter f℥iij, urine high coloured, has slept well; gave gtt. iv of tinct. verat. viridi; 5.30 A. M., vomited soon after last visit; has slept; pulse now 108, catheter f℥ivss, high coloured; gave same dose verat. vir.; vomited before I left; 9 A. M., has slept most of the time; pulse 108, catheter f℥iij; 1.30 P. M., found her sleeping; pulse 112, catheter f℥iv; tinct. verat. vir., gtt. iij; 5.30 P. M., no more vomiting, complains of great pain in sides in breathing; pulse 112, catheter f℥ivss; 9 P. M., complains much of pain; great nausea; pulse 112, catheter f℥v; gave gtt. xl tinct. opii, which was vomited immediately; ordered gtt. xxv every hour. April 4th, 1 A. M., pulse 112, catheter f℥iij; has taken the tinct. opii twice, and slept since last visit; 6 A. M., pulse 104, sleeping, and has slept, no pain; at 9.30 P. M. of this day it is noted that there had been no vomiting all day, pulse 104, but much complaint of pain in bowels upon taking beef essence or ice, these being the only articles allowed since the operation; ordered tr. opii gtt. xxv. On the 6th, her bed was changed, and she passed urine without the catheter,

which had been used at regular intervals up to that time. On the seventh day after the operation, the bowels moved, in response to several mild injections given on account of pain, with efforts to have a passage. The wound was first dressed on the sixth day, the stitches were removed in due time, and the patient had a rapid and excellent recovery, sitting up for the first time just two weeks after the operation. I find no minute made of the time at which the ligatures came away which were applied to the vessels of the adhesions; the large ligature around the pedicle could not be removed until the 2d of June, two months after the operation, and then considerable force was required to draw it out. The patient has been well ever since the operation; she enjoys excellent health at the time of writing this, and menstruates regularly.

CASE II. Mrs. P., aged 24 years, has always enjoyed good health; menstruated first at 16 years of age, after which an interval of a year elapsed without any return of the flow, which then appeared regularly. The first symptom of her present disease was pain; this began some time in the month of January, 1863, and was constantly present afterwards; its seat was the left hypogastric region. On the 22d of February, the patient was married, and very soon thereafter swelling of the abdomen came on, and increased very rapidly, so rapidly, indeed, that she can give no account of any lump or tumour appearing on either side, and her impression is that she was very nearly as large soon after the first appearance of the swelling as when operated on. The menses were absent from February until the 10th of May, and during that period there were, of course, grounds for suspicion of pregnancy; after that date, they recurred regularly about the tenth of every month.

The operation was performed by Dr. DUNLAP on the 4th of August. The patient was very much emaciated, extremely pale, and not presenting a promising appearance for such an undertaking. She was placed under the influence of chloroform, and its action maintained during the operation, so that scarcely an indication of pain was manifested. The steps of the operation were similar to that of the one already given; a moderate incision first, extended afterwards, when found necessary. There was a considerable amount of adhesion immediately under the first incision, so that a cyst was then opened, firm adhesions also connected the tumour with the omentum, and very firm and quite an extensive one existed between it and the small intestine; all these were peeled off, and two vessels required ligatures. The pedicle of the tumour was secured in the same manner as before, a long interval allowed for the cessation of all oozing, and a careful sponging of the abdominal cavity; the external wound was then dressed as before.

As the patient was not under my care, I cannot give an account of her daily progress. No serious symptoms arose, however, and she suffered little, if any more, than women do generally during convalescence from ordinary labour. The ligature around the pedicle has not yet (Oct. 15th) come away. She enjoys good health, has menstruated once, and has gained flesh considerably.

Independent of any value which may attach to these cases, as instances of the successful performance of operation not everywhere recognized as legitimate, or even justifiable, they are of interest so far as they bear upon points relating to the manner of operating, in regard to which the widest

diversity of opinion prevails even among men of the greatest experience. This diversity extends to almost every step of the operation; thus, some prefer a long incision through the abdominal parietes, others as short a one as possible; some secure the pedicle externally by a needle, or sutures, or by a clamp devised for the purpose; others allow it to remain in the abdominal cavity; some take extraordinary precautions as to the temperature of the room, etc.; others none at all; some are extremely careful not to sponge out, or otherwise interfere with the peritoneum; others treat the membrane with as little consideration as the external covering of the body. Under these circumstances, the steps pursued in every case of operation, with the result, should be faithfully recorded, until sufficient numbers have been reached to enable us to decide upon the best of the different modes.

But these cases are valuable in another point of view. They are the first published reports of an operator whose experience may at least be called considerable, whose statistics will compare very favourably indeed with those of the most celebrated English authorities, and who was a pioneer in this branch of surgery. To use his own language, "when he began to operate, it was with great difficulty he could induce a respectable physician to assist or countenance him," and he was solemnly warned by some of the Nestors of the profession to abandon such hazardous operations upon the human frame!

The first operation performed by Dr. DUNLAP was upon a lady of Ross Co., Ohio, in September, 1843.

He has now operated upon nineteen cases with a result of fifteen recoveries and four deaths.

The causes of death were: in one case, hemorrhage; one case peritoneal inflammation; one congestion of the brain, on the seventh day after the operation; and one debility on the tenth day.

Comparing these cases with the published statistics of the best European operators, and we have a very favourable result for the surgery of this country, which holds so prominent a position in the history of ovariotomy. Thus

| | Cases. | Recoveries. | Deaths. |
|---|---|---|---|
| Spencer Wells gives . . | 50 | 33 | 17 |
| Clay " . . | 104 | 72 | 32 |
| J. B. Brown " . . | 19 | 13 | 6 |
| Tyler Smith " . . | 14 | 11 | 3 and 1 error in diagnosis; cancerous disease of the omentum; no injections. |

# TRANSACTIONS OF SOCIETIES.

ART. XIV.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

*June* 27. *Hernia Cerebralis.*—Dr. HUTCHINSON read the following account of two cases of this:—

Charles Fritz, aged 13 years, was admitted into the Pennsylvania Hospital during the night of Monday, July 5th, 1858. Late in the day he had been playing with gunpowder, which, after having moistened with saliva, he fired. Attempting now to pour more powder on the heap, the containing bottle was shattered by the explosion which followed, and fragments of it driven with such violence against the os frontis as to cause a compound comminuted fracture. Early next morning the attending surgeon removed some fragments of glass, together with some pieces of bone, in doing which a portion of the cerebrum protruded. His pulse was at this time 108; in the evening it was 90—presenting at neither time any great peculiarity. He was perfectly conscious, and had no paralysis; had during the day a slight convulsion, which, however, I did not witness. Pupils not particularly affected.

*July* 7. Boy continues conscious. A large quantity of broken-down cerebral matter was discharged from forehead. There is still no loss of motion or of sensibility. Bowels were moved by injection.

8*th.* Rather drowsy; answers, however, correctly when spoken to; there is a slight twitching of the lower extremities; he is unable to open right eye to full extent. Wine whey ordered.

9*th.* Jactitation continues in an increased degree, the left leg being more violently convulsed than the right, the position of the wound being a little to the right of the median line. Pulse 72.

10*th.* Was delirious during night, and so disturbed the other patients in the ward that I was obliged to have him removed to the cells. When spoken to, however, his answers were correct and sensible.

11*th.* Pulse 60. Is much more tranquil; eats well; bowels are constipated; pupils still natural.

12*th.* Not much change in boy's condition. A small piece of glass was discharged to-day. He passed a very restless night; jactitation is, however, less marked. Bowels never moved naturally.

13*th.* Quite a large piece of glass came away to-day. Is still conscious.

17*th.* Pulse has vacillated during the past few days between 60 and 72, being more often the latter. Another piece of glass came away to-day. Complains of severe headache.

20*th.* Fungus of the brain has appeared, the portion protruding being about the size of a walnut. A solution of chloride of zinc, gr. ij to the f℥j, was applied upon it. Boy slightly delirious; headache excessive.

23*d.* Boy has become so very feeble that it is necessary to support him by means of milk punch. Pupils natural.

24*th*. For the first time, I noticed that the pupils were dilated. Is very restless; picked at the fungus with his fingers.

25*th*. Very ill; is unable to speak; made an effort to put out his tongue when told to do so. All the voluntary muscles of his body are rigidly contracted. Is still able to swallow. The attending surgeon removed the fungus with the knife; considerable hemorrhage followed, which was arrested with muriated tincture of iron. Death took place at seven o'clock, twenty days after occurrence of accident.

26*th*. An *autopsy* was made early this morning, twelve hours after death.

The thoracic and abdominal cavities presented nothing abnormal.

The dura mater was much less adherent to the bone than natural. A small piece of glass and spiculæ of bone were found lying just within the brain.

The anterior lobes of both hemispheres were found to have been injured, especially, as had been supposed, the right, which was broken down into a pultaceous mass.

There was abundant evidence of the presence of inflammation in various parts of the brain—a quantity of pus being found at the base of the brain, and a sero-purulent liquid in the fourth ventricle.

The history of the second case, which terminated favourably, is as follows:—

*Fungus Cerebri*.—Dr. JAMES H. HUTCHINSON related the following case:—

Edward Stanley, aged 21 years, a native of England, a seaman by occupation, was brought to the Pennsylvania Hospital early in the morning of May 25th, 1858, with a compound depressed fracture of cranium, caused by an attempt at suicide with a pistol. Upon examination a lacerated wound over right parietal bone was discovered, and by means of a probe a depressed fracture of the bone was distinctly recognized. The bullet had been previously extracted.

The attending surgeon extended the wound, and finding it impossible to elevate the depressed portion, proceeded to the operation of trephining. In the course of the operation the wadding and several small pieces of bone were removed. The edges of the wound were lightly drawn together by means of adhesive strips, and the whole covered with a water dressing. In the evening pulse was 90. No loss of consciousness since his admission. To have gr. x of calomel in divided doses.

*May* 26. Pulse less frequent; he has had no unfavourable symptoms with the exception of severe headache.

28*th*. Pulse 65; headache continues. He does not answer immediately when spoken to. Says his mind is like a kaleidoscope, so confused. Bowels moved by sulphate of magnesia.

29*th*. Pulse was only 45 this morning; it rose to 60 in the evening. He has not slept well since his admission. The attending surgeon prescribed a small dose of sulphate of morphia.

*June* 1. Wound discharges freely a very offensive pus. Pulse varies in frequency, never rising above 60. Mind seems to be perfectly clear, but patient is indisposed to use it. He was moved to the cells to-day, as there was some indication of a renewed attempt at suicide.

3*d*. Condition of patient not materially different from that last noted. No bad effects from the morphia. Patient asked for a book to read. At no time has there been retention of urine.

*5th.* To-day and yesterday the pulse was very much quickened towards evening, and at the same time there were present some of the other symptoms of fever. A small fungus was observed protruding from the wound. No constipation.

*6th.* Fungus much larger, and is distinctly seen to pulsate. Pulse 48.

*7th.* In the evening of to-day the fungus grew enormously; the patient displaying more mental hebetude than I have yet noticed.

*9th.* Fungus has begun to slough.

*11th.* Fungus has disappeared; general condition of patient good. A nutritious diet and tonics prescribed. Bowels have to be moved artificially.

*14th.* The tumour seems to be reappearing. Urine had to be drawn off.

*27th.* The fungus is now about the size of an English walnut. There is no paralysis, but some twitching of the muscles about the mouth. Pupils are very much dilated.

*5th.* Fungus again sloughing; dressed with a weak solution of chlorinated soda.

*7th.* Sat out in the yard for a long time this morning. His gait is slow and somewhat unsteady, but not remarkably so. There is also a slight twitching of the muscles of left arm. Bowels are generally constipated.

*14th.* Pupils are no longer dilated. Wound now dressed with a very weak solution of chloride of zinc.

*18th.* Several small pieces of bone came away to-day.

*August* 30. From the date of the last note his convalescence has been rapid, being protracted only by an attack of diarrhœa.

He remained in the hospital long after the end of August, but I find no note made worthy of transcribing. He continued up to the date of his discharge very silly and flighty, but his previous history, and the answers he made to our questions when admitted, led us to suppose that this was not a condition induced by the accident, but was with him the usual one. He was lately seen by one of the nurses of the hospital, who said that his mental condition remained the same. We have not discovered whether he had ever done anything for a livelihood.

1863. *Oct.* 28. *Fibro-Plastic Tumour of the Dura Mater.*—Dr. H. C. WOOD, Jr., exhibited the specimen, and read the following history of the case from which it was derived:—

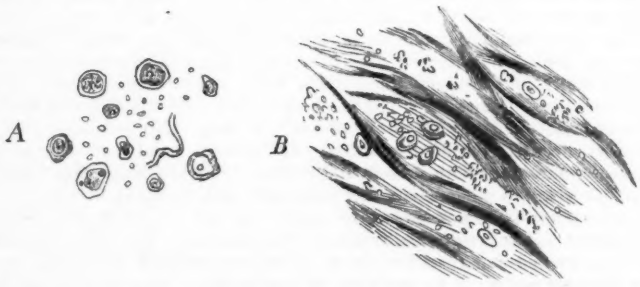
J. R, a native of Scotland, æt. 53, came into the medical wards of Pennsylvania Hospital May 27th, 1863, with the following history. About eight weeks previously, whilst living at service, she arose one morning before light, and on going down stairs fell and hurt herself considerably, but got up immediately. She then went across a room but fell again on the stairs, and there lay unconscious until assistance was attracted by her moaning. Before this accident, she had been perfectly well and bright. She had not had any symptom of brain disease. No headache, loss of memory, or alteration of disposition. On these points I carefully and repeatedly questioned both herself and friends. She had been subject for at least ten years to violent pain, her employers said, in her right arm.

After her fall she was subject to agonizing pain in the head, constant, or nearly so, but with paroxysmal exacerbations. She had also loss of memory and unnatural irritability of temper combined with a failing of the physical powers. At the time of her entrance into the hospital her condition was as follows: She had marked paralysis of the whole of the left side including the face. It was more pronounced in the upper than

lower extremity. Sensation was not very much diminished. She complained greatly of pain in her head. Her bowels were costive. She was ordered ten grains of iodide of potash three times a day, and improved until the 5th of June, when she was attacked with excessive headache, and in a few hours became deeply comatose with stertorous breathing. Cold was applied to her head and a blister to the back of her neck; she was also freely purged. The following day she was less unconscious and rapidly improved, so that on the 10th she walked up stairs to the clinic. After this attack the paralysis of the face was for awhile very marked, and persisted after that of her extremities.

Her intellect continued much enfeebled and her muscular power below par, but she was completely free from pain, was cheerful and walking about until July 5th; on that day she was seized with an agonizing headache, and soon began to lose power in her limbs. By the 17th she was semi-comatose and perfectly helpless, passing her feces and urine in the bed. On the 27th she began again to rally, and in the course of a week or two was about the wards again. Her intellect was more feeble than before her second exacerbation; she was more childish, as well as physically weaker. In the latter part of August she had another similar but less severe attack. From this she entirely recovered; but on the 27th of September had a convulsion, limited, however, to the muscles of the head and neck on the right side. From this time she was evidently failing, and on the 9th or 10th of October a rapid change took place in her. She lost all power over her limbs and sphincters, and was unable even to protrude her tongue; but, strangely enough, there was no marked facial paralysis. She was almost entirely unconscious until her death, which took place on the 19th, unaccompanied by convulsions. During her illness she never was troubled with vomiting or nausea. Her limbs were soft, the flaccid muscles never indicating irritation of the brain.

*Autopsy.*—Cadaver rather fat. Brain substance very slightly congested. An effusion of bloody serum at base of brain amounting probably to half a gill. Meninges brightly injected, closely adherent to the anterior portion of the right hemisphere. There was situated just anterior to the fissure of Sylvius an irregularly ovoidal and lobulated tumour. This was of considerable firmness, but did not creak under the knife, and was surrounded by a very delicate fibrous tunic. It measured one and a half inches in length by one and a quarter in breadth, and three-quarters in depth. The




dura mater coalesced with it so closely that it probably sprang from that membrane. The brain was softened all around the mass, but more especially

posteriorly to it, where its consistency was destroyed for about an inch and a half. There could not be found any indications of apoplectic clots either old or recent. The tumour juice contained numerous irregularly ovoidal cells, mostly containing another nucleated cell (Fig. B). No multipolar or fusiform cells could be found. On section the tumour was seen to be composed of fibrous elements with apparently amorphous material, amongst which were numerous cells and granules similar to those seen in the juice (Fig. A). All the viscera of the thorax and abdomen were examined and found to be healthy.

*Apoplexy Following Railroad Injury of Head. Death, Autopsy, etc.* Dr. JOHN ASHHURST, Jr., read the following report of this case:—

O. H. S., aged about 40, was received into the Episcopal Hospital about 3 o'clock on the afternoon of October 16th, 1863, having fallen in attempting to get off from the cars of the New York line, on the morning of the same day. He had a deep cut through the buccinator and masseter muscles on the right side, penetrating to the bone. He was then (about six hours after the injury) in a state approaching coma, unable to articulate or swallow, but restless and uneasy. I saw him about 10 A. M. on the morning of the 17th, when his condition was as follows: Skin rather cool and clammy, and in the face very dusky, in some places almost blue. Pupil of left eye rather more dilated than on right side, and both apparently insensible to light. Mouth slightly distorted; all the left side of the face seemed flabby and relaxed. The jaw was dropped, and the tongue, which could not be protruded, stiff and very dry; breathing stertorous. When first admitted some bleeding occurred from the right ear, but had now ceased. Slight palpebral but no orbital ecchymosis. Urine had been passed without aid of a catheter.

From the symptoms and history of the case I suspected fracture at the base of the skull; the autopsy, however, proved this to be incorrect.

No marked change occurred until the patient's death, which took place about 8 A. M. of the 18th, nearly forty-eight hours after the injury.

*An autopsy* was made seven hours after death with the following results:

*Rigor mortis* strongly marked; no external injury apparent except the wound of the face above referred to.

*On opening the skull* a considerable quantity of fluid blood escaped, and between the membranes and the brain, pressing on the base of the latter on the right side and posteriorly, was a clot the size of a pigeon's egg or larger.

There was also much uncoagulated blood bathing the base of the brain, and the membranes were exceedingly congested. Altogether not less than four to six ounces of fluid blood had been poured out upon the brain.

*The thoracic viscera* appeared healthy; some old adhesions existed in the right pleural cavity. A long fibrinous clot occupied the right ventricle of the heart, extending into the pulmonary artery.

*The liver* was enlarged, and gave evidence of fatty degeneration; this, with the fact of a whiskey bottle having been found in the patient's pocket, made it probable that he had been a drinking man. *The gall-bladder* was distended. *The spleen* was lobulated but healthy. *The right kidney* enlarged and congested; the left of the usual size and healthy.

No other abnormal appearances were observed.

*Supra Pubic Fistulæ of Urinary Bladder.*—Dr. H. C. WOOD, Jr., read the following history of this case:—

M. M., æt. 25, a cripple from antero-posterior curvature of the spine, in the out wards of the Philadelphia Almshouse, called my attention about the first of August, 1862, to a swelling which resembled a tumour rising up out of her pelvis and reaching nearly to her umbilicus. She said that it was about the same size as when she first noticed it several days before. She made no complaint of inability to pass her water, and refused either to go to the hospital or to submit to an examination. The tumour was not very distinctly separable from the abdominal walls. It was moderately tender to pressure. A day or two after this I left the house temporarily and was absent about a month. After my return I found that the swelling had ulcerated anteriorly through the abdominal walls and discharged several pints of a grumous fluid. She now consented to go to the hospital where she lived six weeks. After the perforation she never passed her urine *per vias naturales*, and said that she had had great difficulty in passing it previously, although the retention appeared never to have been complete. She died of pneumonia supervening on exhaustion.

*Autopsy.*—The cadaver was very much emaciated. There was an ulcer about three lines in diameter two inches below the umbilicus. The cavity of the thorax was very much lessened by the deformity of the spine. The lungs were strongly attached to the thoracic walls by old pleuritic adhesions. The parenchyma was congested and the lower lobe of the left hepatized. Their pericardium was completely adherent to the heart. There was no marked valvular disease. The liver was normal. There was in the walls of the abdomen a large cavity extending down in front of the pubis. Its surface was coated with a thick deposit of amorphous salts, principally urates. With this abscess the bladder communicated by a small ulcer with sharp defined edges, similar to those of a perforating ulcer of the stomach. The opening was at the fundus of the bladder. The walls of the latter viscus were very greatly hypertrophied. The urethra was apparently imperforate. The uterus was normal with the os well formed, but across the upper portion of the vagina stretched a thick fibrous partition. One of the kidneys was normal for about two-thirds its bulk, but the other third was very much contracted, the two parts being separated by a well-defined line. The diseased structure was not granular, but was very dense and firm, and somewhat semi-translucent. In it were several large and freely intercommunicating cavities. No tubules could be found in it, only indistinctly fibrous and amorphous tissue.

*Nov. 25. Syphilitic Caries of the Hyoid Bone.*—Dr. N. W. KING exhibited the specimen and read the following history of the case:—

Michael Timney, seaman, æt. 30, was admitted into the hospital of the U. S. Naval Asylum from the U. S. Gunboat "Albatross," August 31st, 1863. Affected, according to the diagnosis on his hospital ticket, with asthma. At the time of admission the patient was much emaciated; suffered with a severe cough and profuse purulent expectoration, intense dyspnœa and acute pain in the region of the hyoid bone, augmented by pressure and on swallowing. His cough at this period was peculiar and characteristic, producing a sound similar to that elicited by coughing through a metallic tube. In addition to the symptoms above enumerated, he also had a large ulcer on the upper lip. After a careful examination of the patient the following facts were obtained, which have thrown a gleam

of light on what seemed to be an extremely obscure case. He confesses to have suffered with primary syphilis some six years previous to present illness. The cicatrix of the chancre was examined, and I have no reason to believe, from the inspection, that the ulcer belonged to the class of infecting chancres. According to his statement (for the accuracy of which I am not responsible), no consecutive symptoms ever occurred, and no constitutional symptoms were made manifest until the present time. The present affection originated some nine months ago on board the steamer "Albatross" in the Mississippi River. He states that it originally commenced as an ordinary catarrh and with decided aphonia. This condition continued for some months, with the addition of severe attacks of dyspnœa and paroxysmal attacks of coughing. The disease progressed rapidly, and he was sent to this hospital in August last, in what was considered a hopeless condition. On admission he was put on tonics: Oleum morrhuæ, iodide of iron, porter, and nutritious diet. Under this treatment he improved rapidly, gaining strength and flesh, and losing his cough and hoarseness to a certain extent. On the 18th of September, during a severe paroxysm of coughing, he expectorated a fragment of bone. He complained at that time of intense pain in the region of the greater cornua of hyoid bone of right side. I may here make mention of the fact that his expectoration has always been extremely fetid. On the 24th of September another fragment of bone was expelled. Since that time, as the patient's general health had so much improved, he was put upon the use of Donovan's solution, with great benefit. Hoarseness much mitigated and cough not only improved in frequency but in character. As he will be unfit for active duty for a long time, he has been discharged from the naval service. From the history of the case, which has been most carefully studied, I am of the opinion that he is suffering with ulceration of the laryngeal cartilages and caries of the hyoid bone; both conditions, in all probability, resulting from the syphilitic taint.

*Dec. 9. Phthisis.*—Dr. H. C. WOOD, Jr., read the following history of this case:—

M. L., æt. about 35. She came into the medical wards of the Philadelphia Hospital, April 3d, 1862, with the following history: She had been failing for a month, had lost her appetite and strength. A week previously to her entrance she had a chill, since which time she had rapidly grown worse. She stated that she had had bleeding from the nose. At the time of her entrance, her condition was as follows: her abdomen was slightly tympanitic, and she had diarrhœa; her strength was not much; her mind was clear. In my notes I find the following entries: April 4th. Both lungs full of bronchitic rales; coarse crepitation at the bottom of right lung; breathing, 24 per minute; pulse, 102. April 5th. Crepitant rale in left lung, with coarse respiration; pulse, 108; breathing, 24. Tongue very dry, red and chapped. April 6th. Lungs very resonant on percussion anteriorly. Left lung, slight crepitation. Right lung, crepitation extending over lateral and lower portions. Tongue dry, chapped, and red in the centre, with a yellowish fur exteriorly, and its edges moist and red. Right clavicular region, slight dulness and prolonged respiration. April 12th, patient lying in a state of stupor. Pulse very thready and frequent. April 13th, patient dead.

There was one very marked character belonging to the physical signs, and that was their indefiniteness; the crepitation was a rale heard only in

inspiration, and yet wanting the fineness of a true crepitant rale. Death occurred in five weeks from the onset of the disease.

*Autopsy.*—Nails and skin of cadaver, very blue. Lungs, very deeply congested posteriorly; filled with miliary tubercles, especially posteriorly. Infero-posterior portion of left lung in a state of red hepatization. Heart somewhat dilated. Liver very fatty.

*Comminuted fracture of Patella.*—Dr. JAMES TYSON exhibited the specimens, and gave the following history of the case from which it was derived:—

P. B., cab-driver, fell from a hay-loft, striking his head and knee upon a brick pavement. Was admitted to the Pennsylvania Hospital, December 3d, 1863, a few hours after the accident, with slight contused wounds of the head, and a striking injury of the left knee, though any existing condition was greatly obscured by swelling and discoloration. On examination, no crepitus could be elicited; and though there appeared an interspace between two fragments of patella, yet motion applied to the upper or lower edge was communicated to the entire bone. A sedative dressing was applied for the time being.

The patient was a drunkard, and, by evening, was labouring under delirium tremens of a violent character. On removing dressings the following day, the two fragments were distant four inches.

The usual treatment for mania-a-potu failed to accomplish a cure, and the patient died six days after admission, during most of which time he was labouring under delirium.

A post-mortem examination revealed the following conditions: A large effusion of blood existed in and around the joint. The principal fragments, now considerably approximated, were removed and cleaned; when they were found again fractured in the following manner. The upper, transversely, half an inch from its lower margin, the line of fracture extending to the inner edge, where, however, the fragments continued adherent by articular cartilage. The fracture, commencing on the under or articular surface, did not extend through the outer lamina of compact substance, but was met by another line parallel to this compact layer, thus excavating, as it were, nearly a cubic inch of bone.

The lower and outer edge of this principal upper fragment was reduced to a granular consistence, so as to have been necessarily lost.

The inferior fragment, being about one-third the entire patella, was broken into three pieces, adherent by surrounding fibrous tissue and cartilage, but separable on maceration.

A portion of the cartilage covering the articular surface of this fragment, was forced around the upper edge into the cancellated structure, showing the great degree of direct force producing the fracture.

In addition, a considerable part of the centre of the patella was reduced to powder, so that when the fragments were as nearly as possible coaptated, the anterior central portion appeared excavated.

*Dec.* 14. *Mammary Tumour.*—Dr. JOHN ASHHURST, Jr., exhibited the specimen, and gave the following history of the case from which it was derived:—

This specimen was removed by Dr. Thos. F. Betton, of Germantown, from the breast of a female, aged about thirty, and married. Six months previously she remembers having received a blow on the breast from the head of a child with whom she was playing.

The tumour was of the right side, and about the size of a duck's egg. It was quite movable under the skin, and was supposed to be a simple fibrous tumor—the patient stated that during the last three months it had increased rapidly in size. It was found to have firmer adhesions than had been anticipated, and contained two cysts, which were filled with dark fluid blood. Under the microscope, the tumour, as had been anticipated, presented a dense fibrous stroma.

The history of this case was evidently the following: The accidental injury, six months previously, had produced an effusion of blood, which did not coagulate, but became encysted, and in turn produced the tumour.

1864. *Jan.* 13. *Bed Sores following Typhoid Fever; Gangrene of Toes and Scrotum.*—Dr. JOHN ASHHURST, Jr., read the following history of the case:—

C. Y., admitted to the Episcopal Hospital during the summer of 1863, with large bed sores, consequent upon a severe attack of typhoid fever. For some time he rapidly improved, and during October became well enough to sit up, and even walk a short distance. In a few weeks more, however, the cicatrices re-ulcerated, and from this time he became steadily worse. For some weeks before his death, his body was covered with petechiæ. His scrotum and lower extremities now became exceedingly œdematous. On Sunday evening, January 10th, 1864, the swelling left the scrotum and penis, which became black, and presented every appearance of gangrene. The toes of either foot became also gangrenous. The whole lower extremities were morbidly sensitive, the slightest touch giving him great pain. He died rather suddenly on the evening of the 12th. An autopsy was made at noon the next day; rigor mortis well marked. Some congestion existed in the lungs and right kidney; the left kidney was enlarged and pale. Spleen contracted and lobulated. Liver exhibited a slight degree of cirrhosis. The heart was filled with fluid blood, and recent "currant-jelly" clots. Its valvular structure was perfectly healthy.

*Stricture of Rectum, Cirrhosis of Liver, etc.*—Dr. JOHN ASHHURST, Jr., exhibited the specimens, and gave the following history of the case from which they were derived:—

I. M., aged 44 years, was admitted to the Episcopal Hospital, September 21st, 1863, for fistula in ano, which was relieved by an operation performed by Dr. Thomas. At the time of the operation it was ascertained that she had also a stricture of the rectum. She was very much enfeebled, anæmic, and occasionally experienced violent attacks of pain in her epigastric region, accompanied with throbbing. Her bowels were loose rather than constipated, and their operation attended with great pain. She never, while under observation, had vomiting or other evidence of intestinal obstruction. The discharge from her bowels was characterized by the presence of a bloody mucus. For some years she had experienced pain in the region of the liver, extending to the right shoulder. Micturition was painful.

She died on the morning of Dec. 16th, 1863, and an autopsy was made 28 hours after death, with these results:—

*Rigor mortis* slight; no external appearances indicating disease, with the exception of emaciation, which was decided. Head not examined.

*Thorax.—Right lung* adhered to the chest walls, and on its anterior surface slightly emphysematous, congested somewhat posteriorly. Left lung healthy. *Heart* enlarged and filled with clots, principally of the "currant-

jelly" variety. The attachments of the chordæ tendineæ to the segments of the mitral valve were much thickened, giving the margin of the valve a peculiar knobbed appearance.

*Abdomen.—Liver* enlarged, and presenting very perfectly the appearance described as the "nutmeg liver." *Pancreas* slightly enlarged but apparently healthy. *Left kidney* large and pale, with some indistinctness of cortical and tubular portions; right kidney healthy; spleen healthy. About two inches above the anus, the rectum was found to be of considerably diminished calibre, the constriction, however, appearing to be from an unusual thickening of the proper walls of the rectum, rather than from any adventitious deposit. This narrowing, which was to nearly the size of a large goose-quill, extended for about an inch and a half.

The mucous membrane of the gut above seemed softened and eroded. A microscopic examination of the constricted portion of the gut showed fibrous tissue with epithelial cells.

The length of the stricture in this case was unusual, it being stated by Prof. Gross that organic strictures of the rectum generally vary in extent from a few lines to half an inch. [*Pathological Anatomy*, p. 573.]

The distance above the anus, two inches, is that stated by Syme and Curling to be the most usual, though others have placed it as high as six inches, and some have professed to find and treat strictures in the sigmoid flexure of the colon.

Death in this case did not result, at least directly, from the rectal disease, for the constriction was never excessive, and under the careful use of bougies had somewhat diminished.

It is a question of some interest in this case, where the morbid action began, whether in the liver or in the bowel; whether indigestion and intestinal derangement, resulting from hepatic disease, gave rise to the rectal obstruction, or whether to the latter was due the morbid condition of the liver.

*Osseous Degeneration of Valves of Heart.*—Dr. HUTCHINSON exhibited the specimen, and gave the following history of the case from which it was derived:—

J., a seaman, aged 53 years, was admitted to the Hospital of the Protestant Episcopal Church, during the last week of December. His history is not very complete; he said that he had followed the sea up to three months before his admission, and that he had had repeated attacks of rheumatism. Upon examination, he was found to be suffering with disease of the heart, ascites and œdema of lower extremities. He also lost blood freely from internal piles.

A closer investigation of the heart detected hypertrophy, with both mitral and aortic insufficiency. The urine was found not to contain albumen.

The patient died early in January, and the following is the report of the resident, Dr. Gittings, who made the autopsy. About four ounces of serum were found in pericardial sac; hypertrophy existed, as had been diagnosticated, especially developed in left ventricle; in the folds of both mitral and aortic valves were found numerous small calcareous bodies; in addition to this, the edge of one of the folds of the aortic valve was of bony consistence, and entirely separated from the rest of the valve for the space of quite a quarter of an inch. The aorta was found somewhat enlarged, and to have undergone atheromatous degeneration. The liver and one of the kidneys were fatty.

# REVIEWS.

ART. XV. *Medical and Surgical History of the Crimean Campaign.*

1. *La Guerre de Crimée, les Campements, les Abris, les Ambulances, les Hôpitaux, &c. &c.* Par L. BAUDENS, D. M. &c. &c. Paris, 1858.
2. *Relation Médico-Chirurgicale de la Campagne d'Orient, &c.* Par G. SCRIVE, D. M. Paris, 1857.
3. *Maladies de l'Armée (Campagne de* 1854–55–56). Par LOUIS CAZALAS, D. M. Paris, 1860.
4. *Société Impériale de Médecine de Constantinople—Discussion sur la Typhus observé dans les Armées pendant la Guerre d'Orient.* Constantinople, 1856.
5. *Du Typhus de l'Armée d'Orient.* Par FELIX JACQUOT, D. M. Paris, 1858.
6. *England and France before Sebastopol, looked at from a Medical Point of View.* By CHARLES BRYCE, M. D. London, 1857.

AT a period when we have an army of several hundred thousand men actively engaged—the greater number of them at least—in the duties of the field, and exposed not only to the inevitable casualties of war, but to the diseases which ordinarily follow in the train of troops on the march, and prevail more or less extensively in camps and garrisons and during exhausting siege operations, it behooves us to inquire as to what has been the result elsewhere, the extent to which other armies have suffered from disease, the nature of those diseases, the circumstances under which they arose, the causes from which they were found to originate, and the means resorted to for the purpose of arresting their progress, of mitigating their effects, or preventing their recurrence. Such an investigation is not only interesting to medical and other readers as constituting an important item of professional and general history, but is entitled to consideration as a useful object of statistical comparison, and as furnishing hints for the guidance of individuals intrusted with the government and medical and sanitary management of our own armies.

Among the cases most in point none appears to us more entitled to notice than the medical history of the combined armies which lately invaded the Crimea; for while we shall be able, by a comparison of the facts observed in those armies, to show, 1, the evils resulting from a neglect—avoidable or otherwise matters not—of certain hygienic or other measures, it will be perceived that by the adoption of these, advantages of the most marked kind can be and are obtained. It will be further perceived, that the larger number of the diseases from which armies suffer are of the class denominated preventable, and to a certain extent under the control of the medical and other authorities, and that hence their occurrence or diffusion may often, if not generally, be ascribed to negligence, oversight, or ignorance on the part of these authorities.

It need scarcely be stated that during that eventful campaign, the pro-

fessional details of which are embodied in the works whose titles will be found at the head of this article, and which has already been brought to the notice of our readers in an interesting and instructive review contained in our issue of October, 1861, the allied armies, French, English, and Sardinian, suffered considerably more from disease—as well from those peculiar to the climate and localities of the country, as from those arising from other causes—than from the usual casualties of war. This is amply shown by the statements contained in the volumes before us, and to which we shall presently recur. We allude more particularly to what occurred in the English and French armies, inasmuch as, so far, we have not been able to obtain the necessary documents relative to the sanitary condition of the Sardinian troops. It may be proper to mention, at the same time, that the statements relative to the loss of the English army, from the various sources alluded to above, are founded on positive data obtained from the official reports presented to parliament, or from other sources equally entitled to perfect confidence, while the returns we have of the loss in the French army are only approximate, and differ somewhat in the different reports. Even M. Baudens does not support by official references his summary of the casualties of the war. Dr. Bryce properly remarks on this subject that he does not imagine this omission is owing to politic reserve on the part of the writer, but ascribes it rather to the circumstance that the medical department of the French army is not supposed to preserve any records of hospital or field obituary statistics. Hence, notwithstanding his supreme rank and particular mission to the East, M. Baudens could only obtain the collective numbers from the *Intendance Militaire* or *Conseil de Santé* as a favour, sources of information evidently not resorted to by him. We strongly suspect that the absence of these complete and official returns may be due to a reluctance on the part of the war department to make public, documents, which would exhibit to the nation the immense loss the army had sustained in the Crimea, as also the fact that the sufferings of the troops had been proportionately greater than those sustained by the English—that while sickness and mortality increased in the French army as the war progressed, the reverse results obtained among the others, and that such an exhibition would lead to the conclusion that the effect was in part due to the adoption of a sanitary system and of hospital and camp arrangements, contrasting unfavourably with those in operation among the allies. The following statements and remarks will establish these points and place beyond doubt that the Crimean campaign formed no exception to the rule that armies in active war suffer more—experience a larger mortality—from the effects of disease than from the swords and bullets of the enemy.

It will be seen from the statements of M. Scrive, as quoted in general terms, in a former issue of this Journal, that the number of French troops sent out to the East, at different times, amounted to 309,268 men, of whom 200,000 entered the ambulances[1] and hospitals to receive medical aid, 50,000

[1] The word is here used in its proper and correct sense. An ambulance is not, as is supposed in this country, a carriage to carry sick and wounded soldiers, but movable establishments or hospitals, placed near army corps or divisions, and so arranged as to follow their movements, or located in the interior of cities, during the prevalence of epidemics, to insure early assistance to the sick. To each is attached a surgeon (chirurgien major), an administrative officer, a number of assistant surgeons, adjutants, nurses (infirmiers), &c. It is amply supplied with tents, beds, furniture, and dressings for the wounded. All sick or wounded soldiers are received in the ambulance and there prescribed for or their wounds dressed. From thence they are sent back to their corps or the nearest

for wounds and 150,000 for diseases of various kinds. The total mortality, according to the same statement, was 69,229, or 22½ per centum. Of these 16,320 died of wounds 7,507 were killed in action or disappeared, and the balance, 45,422, died from disease. On referring, however, to the work of M. Scrive, and also to other documents, and among them to a report published in the *Moniteur* (23d of Oct., 1856), and prepared by the Minister of War by order of the Emperor, we find that while the number of troops sent out, the acknowledged loss by disease and wounds, and the amount of killed in action, are accurately given, the statement alluded to contains a few inaccuracies in relation to other points which deserve correction, while several details of too important a character to be passed by unnoticed have been omitted.

The following details are copied from the report mentioned as published in the *Moniteur*.

MOVEMENTS OF THE TROOPS.

*Sent Out.*

| | |
|---|---|
| From France | 257,324 |
| " Algeria | 47,983 |
| " Corsica | 1,998 |
| " Italy | 1,963 |
| Total | 309,268 |

*Loss.*

| | | |
|---|---|---|
| Died from time of arrival to 30th March, 1856 | | 62,492 |
| " since that period | | 4,564 |
| No. of men who disappeared and may be included among the dead | | 1,781 |
| Shipwrecked on board the *Sémillante* | | 392 |
| Total loss | | 69,229 |

*Returned.*

| | | |
|---|---|---|
| Returned home on convalescence tickets or furloughs | | 65,069 |
| Strength of the army on 30th March, 1856 | 146,240 | |
| To wit, in the Crimea | 120,476 | |
| " Turkey | 25,764 | |
| Loss during evacuation as stated above | 4,564 | |
| Returned home after peace | | 141,676 |
| " " before | | 20,390 |
| Total returned | | 227,135 |

*Summary.*

| | |
|---|---|
| Troops sent to the East | 309,268 |
| Loss | 69,229 |
| Balance | 240,039 |
| Returned to France and Algeria | 227,135 |
| Leaving a difference unaccounted for | 12,904 |

If now we turn to M. Scrive, we shall find that of the troops sent out, which as stated reached the enormous amount of 309,268, only 7,507 were killed in action or disappeared, while 193,178 entered the ambulances and hospitals

hospital, according to the severity of their condition. From the ambulances light wagons, or horses provided with proper baskets, according to the nature of the ground, are sent to the field in time of action to convey the wounded. These conveyances are in charge of surgeons and nurses. See Tardieu, *Dict. d'Hygiène Publique*, i. 84, 1852.

of the Crimea to receive medical and surgical aid—48,848 for gun-shot and other wounds and the effects of congelation, and the balance, 144,330, for cholera, typhus and typhoid fevers, scurvy, thoracic, and other diseases. By adding to these 23,250 that entered the hospitals at Constantinople—1,149 for wounds, and 22,101 for internal diseases;—and 13,271 cases of all sorts sent to the hospitals of Gallipoli and Varna, we have a grand total of admissions for wounds and internal diseases of no less than 239,699, which, on a force of 309,268, gives us a proportion of one in about 1.28.

Of the deaths, exclusive of the killed, 28,404 occurred in the Crimea, 27,825 in the hospitals of Constantinople, and nearly 5,500 at Gallipoli, Varna, and other places before the troops reached the Crimea. This gives us a mortality of 61,729, which, added to the number of the killed in action, and between 1,200 and 1,300—say 1,250 that died in the Turkish hospitals of Gallipoli, Varna, and Nagara, after the departure hence of the army for the Crimea, gives a mortality, not of 69,229 as given by Scrive, the *Moniteur*, and other authorities, but of very near 70,500 (70,486). This gives nearly one death out of every 4.1 of the entire number sent east; and one in every 3.41 received and treated in the hospitals and ambulances.[1]

M. Scrive's volume, p. 344, contains an official tabular return, showing the number of troops present during each of the twenty-three months they remained in the Crimea, with the number of sick, and the mortality during each month.

From this document we find that the average strength of the army during each of the twenty months the war lasted was 133,770 men, varying from 145,120 (December, 1855) to 38,030 (September, 1854). During the same time, the total number of admissions into the hospital amounted, as already stated, to 193,178, giving a monthly average of 9,478, which varied from 19,443 (June, 1855) to 2,064 (September, 1854). The deaths amounted to 28,404, with a monthly average of 1,391, varying from 3,806 (June, 1855) to 358 (September, 1854). The highest mortality corresponded to the largest number of admissions (June, 1855), but at that time the strength of the army did not exceed 121,887, or 23,233 less than it was in December of the same year, when the admissions did not reach beyond 12,953, and the mortality 1,382. The next highest number of troops, 144,512 (January, 1856), furnished only 13,418 admissions with a loss of 1,763; while the next highest mortality, 2,846, corresponded to 13,454 admissions, the strength being 132,800 (p. 344).

These are large figures, exhibiting a heavy mortality, and illustrating in a most forcible manner the disproportion between the loss by sickness and that by the more legitimate casualties of war. But considerable as the loss appears to have been from the documents quoted, there is reason to believe that it was in reality larger than the French authorities seem inclined to

[1] The following tabular view of the movement of the hospitals of the Crimea, of Constantinople, and of Turkey, from the 10th of April, 1855, to the 30th of June, 1856, is given by M. Baudens:—

| | | |
|---|---|---|
| Remaining on the 10th April | 9,448 | 217,303 |
| Admitted since | 207,855 | |
| Cured | 138,815 | 174,132 |
| Sent to France | 35,317 | |
| Died | 43,024 | 43,171 |
| Remaining at last date | 147 | |

This gives a mortality of one in 5.5 of the number admitted for professional aid, or 19.79 per centum. (p. 402.)

acknowledge; and that the disproportion alluded to was more marked than would follow from what precedes. Thus, Dr. Bryce thinks himself justified, from a scrupulous collection of published and private data, in submitting the following as the lowest summary of French losses:—

| | |
|---|---|
| Killed in action | 8,750 |
| Ambulance service from wounds and diseases | 31,000 |
| Constantinople hospitals | 32,000 |
| Dobrudscha expedition | 6,000 |
| On passage from Crimea to Constantinople | 7,500 |
| Gallipoli, Varna, and elsewhere | 3.000 |
| Of invalids on passage from Turkey to France, and of sick and invalids, &c., on evacuation of the Crimea | 5,000 |
| | 93,250 |

Indeed, we are not sure it is improper to conclude from French authentic documents themselves that the loss in the French army, though perhaps not as large as suggested by Dr. Bryce, exceeded really, in no small degree, the 70,500 mentioned above. As we have seen, the *Moniteur* of the 23d October, 1856, contains a Report published by order of the Emperor, and prepared by the Minister of War. From this document we learn that of the 309,268 men sent out to the Crimea, only 227,135 returned to France and Algeria. Of the others (*i.e.*, 82,135) 69,229 are said to have died, leaving a balance unaccounted for of not less than 12,904. What became of them? What right have we to suppose they all returned safe and sound to France and Algeria as the rest are said to have done? Why may we not, on the contrary, conclude that a large portion of them—perhaps the majority—perished from some cause or other, in the East, on the passage home, or after their arrival there? With regard to this rather considerable item, which is obscurely explained by the Minister, Dr. Bryce asks whether the difference ought to go to the reduction of the number of men sent East, with proportionate increasement of losses by deaths and otherwise, or whether it is simply a novel mode of balancing the debit and credit sides of an imperial expenditure, of which the particulars cannot be produced—a device for concealing the disappearance from the muster-roll of any number of persons not otherwise accounted for, in which category, he remarks, French surgeons have assured him, were many hundreds embarked at Kamiesch for hospitals on the Bosphorus, but who found a resting-place mid-channel. "Mr. Baudens declares that, at one time, two hundred soldiers died daily between the Crimea and Constantinople."

We may add that the disproportion between the loss from disease, and the casualties of war, will be admitted to have been still greater than before pointed out, when it is found that many of the wounded died, not from the direct effects of the injuries they had received on the field or elsewhere, but from attacks of cholera, or typhus, or typhoid fevers supervening while they were under treatment; or from their wounds assuming a fatal character as a result of their systems being contaminated with the poison of one or other of those diseases, or broken down by the scurvy, from which, as we shall see presently, the army suffered to a very great extent. In all these, death should be credited to the complicating and contaminating disease, and not to the original injury.

On a reference to what occurred in the British army, we shall find that while the loss of life, though proportionately smaller than among their allies, was nevertheless large, the disproportion of which we have spoken was equally marked. The total number of men sent to the East, exclusive

of commissioned officers, amounted to 93,959. Of these, as stated by Dr. Bryce, who derived the information from a parliamentary return quoted in the *United Service Magazine*, 2658 were killed in action; 1761 died from wounds and mechanical injuries; while 16,298 died from all other causes, and 12,903 were invalided, leaving a balance of some 60,300 as the remaining effective strength, non-combatants exclusive, at the close of the war. In a tabular return (A.) contained in the *Medical and Surgical History of the British Army in Turkey and the Crimea*, "showing the primary admissions by months into the hospitals of the army, from the 10th of April, 1854, to the 30th of June, 1856, also all the deaths which, during the same period, occurred in regimental and general hospitals, in hospital-ships, or suddenly, or from violence, with the exception of those which occurred in action with the enemy," and in other returns contained in the same volume, we find statements differing but slightly from those given by Dr. Bryce.

Thus, the whole number admitted into the hospitals for diseases and wounds, is reported as amounting to 162,673—144,390 for the former, and 18,283 for the latter. Of this number (162,673) 18,059 died—16,298 from diseases, and 1761 from wounds and mechanical injuries. Of the invalided, the number returned amounted to 13,117—from diseases, 9544, and from wounds and injuries, 3573; while the number killed in action is stated at 2598.

If to this number we add that of the commissioned officers attached to the army, which amounted to 3905, we have a total sent out of 97,864. Of these officers, 157 were killed in action; 579 were wounded—with a mortality of 82; and 255 were invalided. Of the number affected with the prevailing diseases, and of the mortality occurring therefrom, we can find no account. We know, however, that the loss was comparatively small, not exceeding the ratio of 8.4 per cent. of mean monthly strength during the whole period of the war—6.8 per cent. from May, 1854, to March, 1855, and 2.9 per cent. from that time to June, 1856. It must be remarked, in connection with the subject, that the English returns are more precise, full, and accurate than the French, and show no large item of men whose fate was not known to, and explained by, the authorities. So far from this being the case, Dr. Bryce states, on the authority of the Director-General, Army Medical Department, that, at the time of his writing, not ten men of the British expeditionary force were unaccounted for.[1]

Kindred were the results obtained, as well as we can gather, in the Sardinian contingent sent to the Crimea; and similar, indeed, will be found to have been or to be the disproportion in question, observed in all other instances of campaigns undertaken with large bodies of men, unless, perhaps, such campaigns be of very short duration, in healthy seasons and countries, and are characterized by a succession of extensive and sanguinary battles. Under such circumstances, the disproportion in question may be less marked, or may even disappear entirely; but the former of these occurrences, if noticed at all, have been so very rarely; while it appears to us, from all we have been able to gather, that well-authenticated examples of the latter are not to be found on record.

We shall now proceed to offer a survey of the history of the principal diseases by which the French army was so sorely afflicted, reserving to a future occasion a similar account of the progress of the same diseases, as they prevailed among the British troops, and of the measures resorted to,

[1] Page 20, note.

with a view to arrest their ravages and guard against their recurrence, and lastly, a comparison of the results obtained in both armies.

*Cholera.*—Soon after it had reached the shores of the Black Sea, and long before the siege of Sebastopol was inaugurated, the French army encountered a fearful visitation of cholera.[1] It was especially while the troops were operating through the Dobrudscha, and undergoing the fatigues and privations incident to forced marches, that this disease exercised its greatest ravages. At Varna and in the Dobrudscha, as also at Gallipoli, Constantinople, Nagara, Pera and Adrianople, where it manifested itself during the same visitation, the number of cases, from the 3d of July to the 20th of August, 1854, amounted to 8142, with a mortality of 5183. At Varna, in the course of forty-eight days, commencing on the 3d of July—the disease attaining its maximum of intensity from the 30th of that month to the 6th of August—the cases amounted to 2674, and the deaths to 1525. In the Dobrudscha, in thirty days, the cases were 3392—the deaths, 2474. At Gallipoli, in thirty days, out of 1184 cases, 736 died. At the Hospital of the Pera, in forty days, 396 cases occurred, of whom 247 died. The number of troops at Varna and in the Dobrudscha being 55,000, we have, in those places, the proportion of 1 case in 9 men, and a mortality of 1 in $1\frac{5}{10}$ of those attacked; while, taking the whole number of cases, and the mortality in all the places mentioned, we obtain a proportion of 1 case in 7, and a loss of 1 in $1\frac{6}{10}$ cases.

For several months after the army reached the Crimea the disease, though prevalent to a certain extent, from the preceding September, especially among new comers from Varna and France, had lost some of its intenseness, and no longer retained the disposition to spread far and wide it had manifested before. Indeed, so late as May, 1855, the sanitary condition of the troops, which, after the battle of the Alma (Sept. 1854), and during the early days of the siege of Sebastopol, had suffered many and severe hardships, and been exposed to various causes of insalubrity, appeared to have so much improved as to be considered satisfactory. Thus, so far as cholera is concerned, we find that in October, when M. Scrive commenced the detailed reports of the number of cases and deaths, and when the strength of the army was computed at 46,000, 820 cases of the disease were admitted into the hospitals, while the mortality from the same was 289. In November—strength 56,237—the number of cases was reduced to 450, with a mortality of 129. December, with a strength of 65,179, gave 352 cases and 88 deaths. January, 1855, the strength being increased to 78,502, furnished 448 cases and 96 deaths. February, March, and April, respectively, when the army had been still further reinforced, and amounted to 89,309, 96,258, and 91,258, the cases admitted were reduced to 126, 6, and 22; while the mortality amounted to 96, 69, and 5. In May, however, matters began to assume another and more gloomy aspect. The disease once more took on the epidemic character and rapidly spread to every division of the army—filling the hospitals and causing an immense loss of life. In the aforesaid month—strength being 107,760—the cases admitted rose from 22, as reported in April, to 499, with a mortality of 180. June (strength 121,887) presents a total of cases of no less than 4,756, with a loss of 777. In July (strength 118,655), 1215 cases were admitted, and the deaths amounted to 907. In August (strength 119,251), the reports give 998 cases and 649

[1] Scrive, p. 76. Baudens, p. 179, &c.

deaths. In September (strength 125,680), 489 cases and 336 deaths. October (strength 138,532), 559 cases and 296 deaths. Finally, in November (strength 143,250), the cases were reduced to the comparative small number of 177, and the deaths to 125.

From this period the disease gradually subsided, and finally disappeared completely some time before the month of July, 1856, when the campaign closed—giving place, as it receded, to the advent of typhus, which had prevailed extensively the year before; but now assumed, as we shall see presently, a most formidable and fatal epidemic character.

From the preceding statements we perceive that the cholera, after subsiding from October, 1854, to May, 1855, with fair prospects of its total disappearance, broke out afresh, and almost suddenly attained its acmé in point of diffusion and mortality in June, during which and the two following months, it attacked, in an army averaging 120,000, no less than 6,969 men, and causing a loss of 2,333. The ratio of the cases to the strength of the army during those three months was, in June, 1 in 25.62; in July, 1 in 98.48; and in August, 1 in 119.5; while the ratio of deaths to cases was, in June, 1 in 6.12; in July, 1 in 1.34; and in August, 1 in 1.54. The strength of the army during the 14 months embraced in the period in question—from October, 1854, to November, 1855, inclusive—varied from 46,000 (October, 1854) to 143,258 (November, 1855), giving a monthly average of 99,848. The total number of cases amounted to 10,917, with a like average of 779.4, and the total number of deaths to 4,043, with an average of 288.78. The ratio of the average number of cases to average strength is 1 in 126.53; and that of average deaths to average of cases 1 in 2.7.

In the hospital of the medical school in Constantinople, 1,490 patients were admitted from February, 1855, to June, 1856. Of this number, 658, or 44 per cent. (1 in 2.25) died. (*Cazalas*, 102.)

M. Baudens states the whole number of cases from the 10th of April, 1855, to the 30th of June, 1856, in the Crimea, and to the 10th of August of the same year in Constantinople and Turkey, to have been 11,024, with a loss of 5,585, or 1 in 2.3 (p. 402). On the other hand M. Scrive (406) estimates the whole number of cases which occurred in the army, from the commencement to the close of the campaign, to have been 18,400, with a mortality of 11,000. This gives 1 in 15 of the average number of soldiers, and 1 death in 1.6 of the number of cases.

By some of the medical officers the disease in question is said to have been imported and to have spread by contagion. Others, among whom will be found some of the leading physicians, say the disease owed its origin to a special atmospheric constitution of a choleric character pre-existing in Turkey and the Danubian principalities—Roumelia and Bulgaria; while others again attribute it to the importation by the troops, not of the disease fully formed, but of its germs remaining in a latent state in the system of the soldiers, and subsequently brought out into actual existence through the operation of sundry existing morbific influences. Mr. Baudens, whose authority ranks high on all questions of the sort, adopted the latter opinion, which he thought to be the most prevalent among the army medical officers, and seemed disposed to disbelieve the pre-existence of the disease or of a choleric medical constitution of atmosphere in the localities affected (p. 189).

"Sure it is, he says, that Commander Ballard, of the military staff (Etat Major), who, about this period, visited the shores of the Danube, in the vicinity

of Silistria, heard nothing about cholera, either in the army of Omer Pacha, or among the inhabitants of the valleys where the latter pitched his tents."

In another place (p. 179), Mr. Baudens says that the disease was doubtless imported in the east by the successive arrivals of troops belonging to the fifth division of the army, who came from the south of France, where the inhabitants were a prey to the epidemic. At the same time he admits (p. 193) that the cholera is transmitted through the agency of the atmosphere. "It is not contagious in the rigorous sense of the word, otherwise physicians would all be attacked."

Mr. Cazalas, whose means of observation were ample, affirms positively that the choleric influence evidently existed in the Drobrudscha previously to the arrival of the French army, and denies in the most positive manner the contagiousness of the disease.

"I have myself, he says, seen cases of cholera among the native inhabitants, and the information I have collected on the spot, leaves no doubt in my mind on the subject. What proves in the most incontestable manner that such is the fact is that the first division, which was the most severely handled, came from Algeria, where the cholera did not prevail at the time of its departure. Again, the Bachi-Bazoucks, who know neither France nor Algeria, and who had scarcely, if at all, communicated with our troops, were the first attacked and the most violently scourged by the disease. Hence the choleric constitution developed itself spontaneously in Turkey and the Crimea, where our troops were the more severely affected as they were placed under the influence of the worst possible hygienic conditions. Such, at least, is what observation seems to demonstrate."

This extract we obtained from the volume of Mr. Baudens (pp. 189–190, note). In his work on the diseases of the Eastern army, published two years after, Dr. Cazalas enters fully on the subject, and adduces many facts in support of his opinion.

"It has been everywhere proclaimed" he remarks, "that in 1854 the cholera was imported into the East from Africa and France. Now, all the official reports show that the first troops attacked on their arrival from France did not disembark at Gallipoli earlier than the first days of July; whereas a very manifest choleric influence prevailed at Varna over the Anglo-French army long before that period; and that a Zouave of the first regiment who had arrived in the East more than two months before, from the province of Algiers, where the cholera did not prevail, died from that disease in the Hospital of Varna, during the last fortnight of June. It is also stated that in 1854 the choleric germ was introduced into Adrianople by troops arriving from France. Now Dr. Lespian, surgeon of the military hospital, reports that numerous cases of cholera were observed in various parts of the city, long before the appearance of the disease among the soldiers in the barracks" (p. 134).

Dr. Cazalas states, that in the months of September and October, 1854, a number of choleric patients—some convalescent and others actually sick—arrived from the Crimea at the hospitals of Pera, Maltépé and Ramis-Chiftlik. Nevertheless the disease was not communicated to any one in either of those establishments. In 1854 and 1855 choleric patients arriving from France, the Crimea, Varna, the neighbouring camps, &c., passed through Constantinople daily; and yet, notwithstanding, cholera never spread epidemically in that city. The Imperial Guard and the two divisions of reserve which had suffered severely from cholera while encamped at Maslak in April, 1855, arrived in the Crimea in May, carrying along with them the seeds of the disease. Soon after they had landed at Kamiech, the latter increased to a certain extent; but soon decreased rapidly, and finally disappeared completely. Almost all the troops arriving from France or Con-

stantinople were more or less afflicted by the disease after their landing, as had been the case with the Imperial Guard and reserve; but in no instance was it communicated to the other troops.

"From the 28th January, 1855, to the 31st January, 1856, 1488 cases of cholera, arriving from France, the Crimea, Maslak, the city and the neighbouring hospitals, were admitted into the hospital of the military school (Constantinople), which was specially appropriated to that disease. All the severe cases were treated in separate wards; whilst the light cases and the severe ones during the period of convalescence, were distributed among patients labouring under ordinary complaints, the average number of whom amounted to from five to six hundred. Notwithstanding this, not only was the cholera not communicated in the wards to ordinary patients, but all the persons employed in the hospital—physicians, orderlies (infirmiers), apothecaries, Sisters of Charity, chaplains, administrative officers—escaped. It was only in the month of June, 1856—five months after the disease had entirely disappeared—that some choleric symptoms and two slight cases of cholera were observed within the precincts of the establishment" (pp. 139–8).

To the same view of the subject M. Scrive is strongly inclined; and as the position he held as physician in chief of the army of the Crimea afforded him the fullest opportunities of deciding questions of the kind, his opinion must necessarily carry great weight. At the same time he admits that the doctrine of those who refer the outbreak of the disease to the development of imported choleric germs, sustained, as it seems to be, by the appearance of cases of that disease on board of ship during the passage from Marseilles to Varna, is entitled to respectful consideration. Nevertheless he does not think that it deserves as much attention as the doctrine of the pre-existence of a choleric medical constitution of atmosphere in the localities affected.

"Thus, before contact with the infected troops had taken place—even a fortnight before—a manifest choleric influence existed in the army. The reports of the physicians were very explicit on this subject. They pointed out the existence of numerous attacks of cholerine; such was especially the case with two of these reports. One from the physicians of the third Zouaves (second division) dated on the road from Adrianople to Varna; the other from the physician of the ninth battalion of the foot chasseurs, give full details of the symptoms of the disease observed; and those symptoms are certainly those of violent cholerine. Indeed, in the course of the last fortnight of June, a Zouave died of a rapid attack of cholera in the hospital at Varna. And yet the men had been in the East nearly two months. These observations lead to the admission of the existence of a choleric medical constitution in Roumelia and Bulgaria; unless we can believe in an incubation of more than two months. And, even then, whence could the germ of this incubation have been derived, seeing that the disease existed neither in France nor in Algeria at the time of the first departure of troops? True, it is probable that the contact of new troops that had derived the choleric germ in France, may have facilitated the development of the choleric influence, feeble as yet, but kept up in the old soldiers through the influence of special climatic conditions. I am disposed to make this small concession to the doctrine of transmission; but feel firmly convinced that our army, even in the hypothesis of its having been deprived of all communication with France since the middle of June, would not have escaped the cholera, the imminent and near advent of which was foreshadowed by the medical constitution of the moment."

M. Scrive s no believer in the contagion of cholera, in the rigorous acceptation of the term, though admitting the possibility of condensed emanations derived from numerous choleric dejections accumulated in a room or an hospital ward, exercising an energetic cholerizing influence on

persons in health living in that atmosphere. But these he holds in the light of exceptional cases. Under all other circumstances he denies the possibility of cases of imported cholera communicating it and occasioning a true and devastating epidemic, unless there exists in the atmospheric condition of the place a native predisposition to the disease. The truth of this proposition, he maintains, was amply demonstrated during the campaign in the Crimea. "Thus, how often did we not observe there on a surface of country of 12 square kilometres, cholera, imported through arrivals from France and Turkey, die out in a few days for want of dispositions favourable to its development. Had it been otherwise, the army of the Crimea would never have achieved the great enterprises by which it has been so frequently illustrated. It would have been entirely destroyed by the effects of the disease by which almost all the bodies of men arriving monthly to fill up the ranks of the army were infected. The most striking example of this immunity to transmission was observed at the time of the arrival in the Crimea of the entire Imperial Guard and of the two divisions of the reserve. These troops, while suffering from the cholera at Constantinople, received orders to proceed to the Crimea, and there, the choleric principle which they carried with them, instead of spreading among the old divisions of the army, immediately diminished in intensity and soon disappeared completely.[1]

But whatever may have been the mode of origin of the cholera in the French army during the Crimean campaign, the facts observed show conclusively, or rather fully confirm an opinion arrived at long before in other parts of the world, that whenever the disease breaks out spontaneously or otherwise in any locality, it acquires, to use the words of M. Scrive, "an extraordinary power of destruction by association with the ordinary great perturbative and disorganizing morbid causes—small and ill ventilated habitations, the vicinity of divers sources of infection, concentrated animal and vegetable effluvia, the overcrowding of a large mass of population, excessive fatigue, exciting passions of the mind, and the painful privations and other trials so commonly incident to the life of soldiers during prolonged wars. These causes, according to M. Scrive, aggravate in an enormous proportion the mortality of cholera, either primitively in cases of sudden invasion, occasioning instant death; or secondarily, through the influence of incomplete reaction leading to typhoid complications, which are almost always fatal. The latter transformation, which was observed but rarely during the period of increase of the cholera of Varna, but became more frequent during the period of its decrease, constituted the almost constant feature, and the almost invariable cause of death, of the attenuated forms of the disease observed in the Crimea by the physicians of the army."[2]

*Bowel Complaints.*—The French army suffered considerably from bowel complaints in the forms of diarrhœa and dysentery. Of the former, 19,339 cases were reported, causing a mortality of 1,984, or about one in ten; while of the dysenteric form, 6,105 cases occurred, and of these 2,061, or one in three, died. In the hospital under the charge of M. Cazalas at Constantinople, or to which he was attached, 1,976 cases of diarrhœa and 522 of dysentery, making a total of 2,498, were admitted in 1855 and the first seven months of 1856. Of the former 766, or 1 in 2.5; and of the latter 215, or 1 in 2.4, died, giving a proportionate mortality of 1 in 2.5 of the total number admitted (p. 72). It must be remarked, that those numbers,

[1] 84, 5, 6.

[2] Page 87.

large as they are, include only simple cases of both diseases and those of either kind which were sufficiently violent to predominate in instances of complication with other complaints. In proof of the great frequency and fatality of these diseases, M. Cazalas remarks that from the commencement of the campaign they constituted one-fifth of the totality of cases admitted, and over one-third of the totality of deaths (p. 73). In the Crimea they constituted a little less than one-eighth of the cases admitted, while the mortality amounted only to 1 in 42. The smallness of the mortality here mentioned, and the largeness of that reported by M. Cazalas as having occurred in his hospital at Constantinople, may be accounted for by the fact that many, if not most of the cases admitted in the establishments of the Crimea—14,807 out of 25,444 cases—were sent to Constantinople, there to die or recover. M. Scrive remarks that the special climate of the Crimea, the choleric influence existing at the time, the conditions incident in every way to the painful life of soldiers, were the principal causes of those diseases. Except in cases complicated with cholera, which frequently occurred, diarrhœa did not assume a dangerous character. The disease was often complicated with scorbutic phenomena of various degrees of intensity. The dysenteric cases, with the exception of a certain number exhibiting an infectious character, were not as malignant and fatal as they usually prove to be in Algeria. Many recovered unless the disease presented grave complications or was associated with some epidemic complaint. In both events the danger of a fatal termination was greatly increased. Both diseases prevailed most extensively during the hottest days of summer, but nevertheless, were observed at all seasons of the year. (*Scrive*, pp. 345, 429.)

M. Baudens states that diarrhœa and dysentery constituted a most frequent source of complication in fever cases. Two-thirds of the patients affected with these diseases, admitted in the hospital of Constantinople, presented such complications. "Diarrhœa, as he remarks, was sufficiently prevalent to justify the statement that diseases were almost all preceded by symptoms of acute diarrhœa, and followed by those of the same complaint in a chronic form. This fatal complication is not peculiar to the army of the east. It is observed in all armies in the field. It is the result of the mode of life of soldiers, of bad nourishment, of nostalgia, and of a thousand influences which it is impossible to guard against."[1] Dysentery he says is almost invariably ushered in by diarrhœic symptoms of greater or less intensity. It constitutes in fact the second stage of that disease. "Intestinal alterations carried as far as ulceration constitute the anatomical lesions of the two diseases." M. B. is of opinion that acute diarrhœa would have prevailed still more extensively had it not been for the moral energy which, during the whole course of the campaign, and in spite of everything, sustained the French troops, and was never more powerfully manifest than at the most critical moments (pp. 203, 204, 205, 206).

M. Cazalas, who records opinions very similar to those entertained by M. Baudens, founded on what he observed at Constantinople and elsewhere, and unites with Desgenettes, Fournier, and Vaidy, in the statement that dysentery, under which name they evidently include chronic diarrhœa, causes more deaths in armies than typhus, yellow fever, or plague, in like manner dwells on the great frequency of complication of intestinal complaints with other diseases, especially scurvy. Of 4,114 cases of all diseases

[1] Baudens, 203–4.

treated in the wards under his special charge, 1,537 were affected with the complaints in question. Out of this number only 406 presented either a simple or uncomplicated form. The balance, 1131, were combined with other diseases, as follows: angina 2, ophthalmia 3, hæmeralopia 1, jaundice 10, ascites 1, anasarca 10, albuminuria 6, bronchitis 30, pleuro-bronchitis 16, pleuro-pneumonia 3, pulmonary tubercles 8, congelation 98, scurvy 452, scurvy and anasarca 21, scurvy and intermittent fever 85, intermittent fever 170, intermittent fever and congelation 7, remittent fever 138, remittent fever and congelation 16, typhoid fever 54. From this it results that out of 4,114 cases treated by M. Cazalas, more than one-third were labouring, when admitted, under dysentery and diarrhœa, either in a simple form or complicated with other diseases; and that in more than two-thirds of the individuals thus affected, those diseases were complicated with other complaints of a more or less severe kind. It may be added that of the whole number of cases (4,114), 1,098 died, and that out of this number 359, or a little over one-third, were carried off by one or other of those complaints, simple or complicated; and that the mortality among the dysenteric and diarrhœic cases was in the ratio of 1 to 4.2—359 in 1,537 (pp. 73, 4.)

*Scurvy.*—A short time after the arrival of the French army in the Crimea, the troops began to suffer from the scurvy, a disease which was destined to play a most important and painful part among the causes of the ordeal through which they passed during the remainder of the campaign. In relation to the events of that early period, M. Scrive remarks:—

"Already the old soldiers began to present the opening symptoms of scurvy. Slight pain in the lower limbs, a slight irritation and swelling of the gums, petechial spots on the skin. Such were the only apparent signs at the outset, and our brave soldiers did not discontinue their terrible labour."

In November, out of 5,882 admissions in the hospitals (including 450 wounded Russian soldiers), only 40 are reported as presenting symptoms of scurvy. In December the number had increased to 100 (out of 6,348 admissions). In January, 1855, it rose to 452 (out of 9,092). But the disease now began to attract special attention from its undue increase, both as regards the number of cases and the severity of the symptoms. It more particularly assailed the older and the best seasoned soldiers. In February, 689 cases were admitted (out of 8,194). In March, 770 cases were admitted (out of 7,585). April gave 917; in May the number diminished to 189; in June it rose to 630; July presents a report of 1,240; August, 2,600; September, 1,488; October, 707; November, 717.

But these numbers, large as they are, and calculated as they were, to create great alarm respecting the sanitary condition of the army, were far from including all the cases existing. Many, though labouring under indubitable signs of the disease, did not seek relief in the hospitals, remaining at their quarters and continuing to attend to their duties. In February, 1855, when, as we have seen, 689 cases were admitted, the regiments, as M. Scrive informs us, contained not less than 3,000 cases of the disease, 100 in the old, and 25 in the new regiments. He adds that none of those he noticed in his visits were of an absolutely severe character. More than two-thirds, he says, presented but slight symptoms, as tumefaction and erosion of the gums and petechia, 600 were more severely affected, while in 400 the symptoms were sufficiently marked to call for regular treatment, and for their being sent to Constantinople. The troops employed in the siege operations were less

affected than those composing the army of observation. Those especially were severely attacked who had been allowed one or two furloughs.

The following tabular return, showing the number of cases which occurred monthly in all parts of the Crimean army, whether admitted into hospitals or treated elsewhere, together with the mortality, the ratio of cases to the number of troops, and of deaths to cases from October, 1854, to June, 1856, inclusive, may properly find place here :—

| | Months. | Admissions. | Deaths. | Average No. to Strength. | Av. Deaths. |
|---|---|---|---|---|---|
| 1854. | October | 20 | | 1 in 2,300 | |
| | November | 80 | | 1 " 700 | |
| | December | 800 | 2 | 1 " 70 | 1 in 400 |
| 1855. | January | 1,575 | 6 | 1 " 43 | 1 " 263 |
| | February | 789 | 6 | 1 " 115 | 1 " 131 |
| | March | 452 | 3 | 1 " 213 | 1 " 151 |
| | April | 348 | 8 | 1 " 287 | 1 " 43 |
| | May | 132 | 2 | 1 " 825 | 1 " 66 |
| | June | 350 | 4 | 1 " 346 | 1 " 180 |
| | July | 1,140 | 8 | 1 " 104 | 1 " 142 |
| | August | 2,400 | 10 | 1 " 49 | 1 " 240 |
| | September | 1,388 | 20 | 1 " 91 | 1 " 69 |
| | October | 707 | 26 | 1 " 198 | 1 " 31 |
| | November | 718 | 35 | 1 " 205 | 1 " 20 |
| | December | 1,248 | 53 | 1 " 116 | 1 " 23 |
| 1856. | January | 3,980 | 132 | 1 " 36 | 1 " 28 |
| | February | 4,341 | 156 | 1 " 31 | 1 " 34 |
| | March | 1,787 | 132 | 1 " 66 | 1 " 13 |
| | April | 785 | 31 | 1 " 134 | 1 " 28 |
| | May | 275 | 4 | 1 " 248 | 1 " 67 |
| | June | 50 | 1 | 1 " 500 | 1 " 50 |
| | | 23,365 | 639 | 1 in 320 | 1 in 94$\frac{2}{10}$ |

In one of the hospitals of Constantinople—that of the Medical School—from January, 1855, to July, 1856, 3008 cases of the disease were admitted. Of these 284 died; being in the proportion of 1 in 10.5. The whole number of sick of all complaints admitted into the establishment, during the same time, being, as already stated, 12,075; we perceive that the proportion of scorbutics to the sick amounted to 1 in 4. The proportion may indeed be said to have been even larger than here stated; inasmuch as the disease only prevailed among the patients arriving from the Crimea—those arriving from France being entirely exempt from its effects. The number of the latter amounting to nearly 9,000 (8.994), it follows that the ratio of scorbutics to the sick generally may, with the strictest propriety, be set down as 1 in 3.[1]

In the cases before us, as in those occurring everywhere under the influence of similar agencies, the principal cause of the disease was sought in the prolonged and uniform use of gross food—especially of salt meat—and the long deprivation of fresh vegetable substances, aided by adjuvants of a more or less energetic character, arising from the mode of life to which soldiers are exposed, as also by excessive fatigue and the effects of a low temperature, associated with a humid condition of atmosphere. Of all the aggravating causes, the latter association—of cold and humidity—was found to be the most energetic. In a few days slight cases under its influence assumed a most threatening and dangerous aspect, by being suddenly

[1] Cazalas, p. 79.

attended with œdema of lungs. To these must be added nostalgia and other depressing passions of the mind, contracted, ill-ventilated, and dark habitations, &c. It may be stated, in connection with this subject, that the disease was found to prevail very extensively during two seasons of opposite character—during the coldest and dampest days of winter and the hottest and dryest of summer. But as is remarked by M. Scrive, these are seasons when the earth is deprived of vegetation—a condition he regards as exercising the most powerful influence in the production of the disease (p. 427). In some instances the patients laboured simply under pure scurvy. In many others the disease appeared in connection with diarrhœa, dysentery, typhus or typhoid affections, and especially with congelations, which complications were greatly facilitated through the influence of the liquidated state of the blood, and had in their turn the effect of greatly aggravating the scurvy itself.[1]

In illustration of the frequency of the disease and of its complications, M. Cazalas states that of the 4114 cases of diseases treated in his ward at Constantinople, 1374 were scorbutic. In 481, or about one-third of these, the disease assumed a simple and uncomplicated form. In the other cases it showed itself in association with the following complaints: chronic diarrhœa, 436; chronic diarrhœa and intermittent fever, 85; chronic diarrhœa and anasarca, 21; chronic dysentery, 32; chronic dysentery and œdema of the glottis, 4; intermittent fevers, 60; gastric remittent fever, 112; typhoid remittent fever, 44; congelation, 41; gangrene, 1; otitis, 3; severe bronchitis, 56; and pleuro-pneumonia, 1 (p. 80).

From this it follows, as M. Cazalas remarks, that confirmed scurvy, simple or complicated, prevailed in one-third of the patients treated in his hospital, and in more than one-half of those coming from the Crimea. He adds that if it were possible to include in the estimate of the number affected with the disease all the cachectic men in whom scurvy was not sufficiently marked to be positively diagnosed at the first visit, it may be averred, without fear of mistake, that from the beginning of the winter of 1854 to the close of the campaign, all the patients arriving from the Crimea were, with a few rare exceptions, more or less tainted with the scorbutic vice, which imparted to every disease a remarkable character of chronicity, tenacity, and gravity (p. 80).

*Thoracic Diseases.*—Of the number of cases of thoracic diseases which occurred in the army during the war, and of the mortality accruing therefrom, it is impossible to form an idea, as these are mixed up with other complaints accompanied with fever, and included under the general heading of febrile complaints (fièvreux). The cases occurring in the Crimea numbered 42,453. Of these, 34,420 were sent to Constantinople; 6902 were discharged cured; and 1731 died. In the hospitals of Constantinople 63,124 were received from Varna and the Crimea; 8038 were admitted from the troops stationed there; 35,625 left cured or convalescent; 22,988 were sent to the Turkish hospitals or France; and 12,549 died. Of thoracic complaints proper M. Scrive tells us that during the first winter, which was less severe than the second, the number of cases, especially of pneumonia and pleuro-pneumonia, was limited; but during the second winter, the low degree of the temperature, which at times was considerable, produced a rather large amount of inflammations—more or less pure—of the bronchia, of the lungs, and of the pleura. In general these

[1] Scrive, pp. 389, 426, 27, 8.

diseases were complicated with other complaints. In cases in which such complications did not present themselves, these diseases went through a regular course, and occasioned but a limited mortality. But in instances in which, for example, scurvy had destroyed the cohesion of the blood, the lungs often became the seat of sanguineous extravasations or of œdematous effusions. Such cases seldom ended in recovery; and sometimes proved suddenly fatal by asphyxia.

*Paludal Fevers.*—The army suffered in a marked degree from malarial fevers of the intermittent and remittent types, a form of disease—of the latter type particularly—very prevalent in the country, where it is regarded by the Russian physicians as endemic, and as sparing no classes of individuals, whether native Tartars or strangers. Of the existence in the country invaded of localities capable of producing the evil in question, as also of a range of thermometrical heat and atmospheric humidity associated with such localities in giving rise to such effects, and of the fact that the French troops were placed under circumstances rendering them susceptible of the disease, there can be no possibility of doubt. The Valley of the Tchernaya lies to the eastward of the northern portion of the plateau which overhangs it by nearly perpendicular cliffs, and is several miles both in length and width. On the northwest it extends to the Inkermann Valley, between the heights of the plateau and the ruins of Inkermann, to the head of the harbour. On the north it is defined by the Mackenzie Heights. On the east it is closed by the elevated district which separates it from the Valley of Baidar; and on the south it is separated from the Valley of Balaklava by a chain of hills, which extends from the north of Kamara to the westward as far as the plateau. Through the centre of this valley runs the River Tchernaya, which, after a tortuous course among the hills to the eastward, descends into the valley near Tchorgoun, and thence proceeds through the narrow defile which leads to the head of the harbour; and south of this river are the series of hills several hundred feet above the sea level, and known as the Fedeukine Heights. (*Med. and Surg. History of the British Army*, vol. ii. p. 16.) It may be stated also that the Valley of Balaklava becomes contracted as it proceeds south, and passes by a narrow swampy gorge between lofty hills on either side. (*Ib.*) The shores of the Tchernaya, along which a part of the army was encamped, are marshy; and between Eupatoria and the camp there are not less than four rivers, the margins of which are in a similar condition; while everywhere about this position may be found a mixture of salt and pure water, the malarial effects of which are well known. (See *Discussion, &c.*, p. 65.) As a natural result, the disease was particularly rife along these marshy localities, and though the influence of the cause continued to manifest itself during the whole course of the winter months, so as to give rise to complications with other diseases—in other words, to occasion what may be called hybrid complaints—as also to produce occasional attacks of pure or simple malarial fevers, it appeared much more specially rife during the hot weather of 1855, when it soon filled the hospitals and ambulances with both officers and soldiers. So common, indeed, were the various forms of the disease, and the complications to which it gave rise, that by high authorities it is regarded as having constituted the principal complaint prevailing among the troops; most of the cases reported as typhus being merely remittents modified by a typhus or adynamic condition of the system.

Remittents, as M. Scrive informs us, made their appearance at the end of May, under the influence of excessive heat, paludal emanations, and the

fatigue incident to the service, and spread extensively during the months of June, July, August, and September.

"Of slight character when they presented themselves devoid of complications, these fevers had a mean duration of three septenaries, exclusive of the time of convalescence, which was prolonged, and during which the patient remained very feeble. They associated themselves with all the severe morbid types then prevalent, and especially with the typhic or typhoid forms" (p. 391).

The disease, though intrinsically of little severity, assumed a highly tenacious and dangerous character in soldiers whose systems had become strongly impregnated with the paludal poison in Algeria, or whose constitutions were enfeebled and had lost the power of resistance. In some cases, it assumed the pernicious form. In general, however, it presented itself with symptoms of greater or less reaction. Nevertheless, often the type, in the intermittent form, was not pure and well marked—the hot stage coming on without being preceded by a cold stage or chill, or going off without the usual critical sweat. The intermittents yielded to moderate doses of quinia; while, on the contrary, the remittents ran their regular course, unchecked by the specific, during several septenary periods. The disease appeared to be little more than a complication of the prevailing continued fevers, most cases of which were associated with symptoms arising from the action of the paludal poison. In other instances the paludal fever was the original disease. The same may be said of cholera, diarrhœa, and dysentery, for while instances of these diseases, unaccompanied by phenomena denoting a complication with intermittent or remittent fever, presented themselves, cases of the latter fevers seldom remained long without exhibiting signs of a choleric, dysenteric, diarrhœic, or typhous taint. To these complications, especially with cholera and typhus, is to be ascribed much of the mortality occasioned by these fevers.

In illustration of the frequency of these malarial fevers, as also of the complications in question, we may again borrow from M. Cazalas the results obtained at the hospital of the medical school of Constantinople during 1855, and the first seven months of 1856. Of 12,075 cases of all diseases admitted in that establishment—nearly three-fourths of which came from the Crimea—1,589 were affected with malarial fevers, being in the proportion of 1 in 7.6 of the whole number. Of these, the intermittent fevers amounted to 587 and remittent fevers to 1,002—1 in 20 of the former, and 1 in 12 of the latter. In M. Cazalas's ward 1,207 cases of these fevers were treated, 427 intermittents and 780 remittents. Of the former 355, and of the latter 511—866 of both types combined—were complicated with other diseases. Of these complications, M. Cazalas gives the following details: Simple cases with gastric derangement, 72; with continued gastric fever, 269; gastric fever and scurvy, 109; gastric fever and bronchitis, 25; gastric fever and hæmoptysis, 1; gastric fever and pleuro-pneumonia, 4; gastric fever and jaundice or congestion of the liver, 4; gastric fever and chronic diarrhœa, 118; gastric fever, diarrhœa, and congelation, 16; gastric fever and dysentery, 20; gastric fever and purpura, 3; gastric fever and smallpox, 2. With typhoid, 164; typhoid fever and diarrhœa, 6; typhoid fever and bronchitis, 7; typhoid fever and congelation, 4; typhoid fever and scurvy, 41; with scurvy alone, 60; chronic diarrhœa, 148; chronic diarrhœa and congelation, 7; chronic diarrhœa and pleuro-pneumonia, 2; with dysentery, 32; with bronchitis, 10.

These complications occurred at all seasons of the year—in winter as in the spring; in summer as in autumn (pp. 61–2).

The number of cases reported in the Crimea during the campaign was 19,525, with a mortality of 1,985, or about 1 in 10. Of the whole number, the intermittent cases amounted to 6,983, with 4 deaths; the remittents to 12,267, with 1,795 deaths; and the pernicious to 275, with 150 deaths. Of those who died in the Crimea—17,540—7,855 were cured, and 9,685 were sent to Constantinople, where many died. The disease, as already mentioned, prevailed principally during the hot months of 1855. Of the remittents, 2,358 with 69 deaths were reported in August; 2,073 and 67 deaths in July; 1,288 and 66 deaths in September; 1,260 and 68 deaths in June; October, 1855, and February, 1856, gave respectively 853 and 840 cases. After this, the disease tapered off, the number varying from 681 to 29. The mortality in December, 1855, and January, February, and March, 1855, when the disease was strongly complicated with the typhous element, was very large. In the first of these months it amounted to 247 out of 725 cases, or 1 in 2.3; in January, 260 out of 529, or 1 in 2; in February, 482 out of 840, or 1 in 1.8; and in March, 250 out of 681, or 1 in 2.7.

*Typhoid Fever.*—From an early period of the campaign, typhoid fever prevailed in the army to a considerable extent. It was first noticed in its pure form, or as an element of complication with other diseases, at Gallipoli. It next showed itself at Varna, and afterwards prevailed more or less extensively at Constantinople and in the Crimea, where, in January, 1856, it spread, especially among young soldiers, "whose constitutions," as remarked by M. Scrive, "become with difficulty inured to the privations and fatigues of a soldier's life, especially when far from home" (p. 287). Exclusive of the cases that may have occurred among the troops at Constantinople and elsewhere, the number reported by M. Scrive as presenting themselves in the Crimea and previously at Varna, amounted to 6351. Of these, 1060 were discharged from the hospital; 3663 died; and 1628 were removed to Constantinople. The mortality thus occasioned by the disease reached the high proportion of 1 in 1.73. What the number of cases which occurred in the hospitals of Constantinople, or the mortality to which they gave rise was, we have not been able to ascertain.

Whether the disease prevailed to the extent naturally to be inferred from the magnitude of the figures just noted, is a question which is far from having been satisfactorily settled. Sure it is that in many of the cases reported under the head of typhoid, the disease cannot, with any sort of propriety, be held up as having exhibited in its purity the characters which impart to that fever the degree of individuality distinguishing it from other forms of febrile affections. Writing under date of the 27th July, 1855, M. Scrive says that, judging from the cases he saw in the various hospitals visited by him, he does not think they could be regarded as instances of true typhoid. He inclines to the belief they should more properly be viewed in the light of remittent fevers, occurring in men whose constitutions were deteriorated, and assuming a typhoid character (p. 215). It complicated other diseases, wherever it prevailed, and often constituted, when thus combined with typhus, a peculiar form of fever, the diagnosis of which was not always easily made out. In such cases the symptoms of adynamia usually appeared two or three days after the first septenary period.

"They certainly presented the physiognomy of typhoid fever; but on close examination great differences were found. Thus, the regularity of the periods

was wanting; the pathognomonic symptoms, as the rose lenticular spots, the sudamina, the gargouillement in the iliac fossa were not observed. The resemblance arose from the community of some abdominal symptoms. Thus, in typhus cases of this kind, the patients were affected with nausea, occasionally vomiting, and diarrhœa, a marked sensibility and general doughy feel (*empatement*) of the abdomen. But the abdominal symptoms were always accompanied with typhous stupor, in a less extent, however, than in the other forms of the disease. When the cases did not assume a greater degree of gravity than that just mentioned, a beneficial change occurred rapidly, and convalescence was short—which is not the case in typhoid fever. In other instances, the disease assumed a more dangerous aspect on the 13th or 14th day; the tongue became dry, parched, and covered with fuliginous—often bloody—matter; delirium succeeded, and became constant, accompanied with carphologia; the circulation and respiration became gradually weaker, the matter of perspiration assumed a fetid odour, and was gluey; the discharges of urine and fecal matter were involuntary, and death was preceded by large bed-sores."

But while entertaining the views mentioned respecting the nature of the above cases, M. Scrive does not appear disposed to deny the existence of real typhoid fever at all periods of the campaign, and under all circumstances. Indeed, he admits its prevalence, not only in a statement already referred to, but in several others scattered throughout this work. Of the propriety of this admission, no one will entertain a doubt who consults the volumes of MM. Cazalas, Jacquot, and others; for therein we find sufficient facts to satisfy us that the fever in question, both in its pure form and as an element of complication, prevailed to no inconsiderable extent, especially during the first winter of the campaign, both at Constantinople and in the Crimea, as proved by the symptoms observed during life, and the lesions found after death. Indeed, it would be difficult to see how the prevalence of the disease in an independent form could be doubted, when we find that it complicated not only paludal fevers, but almost every other disease—typhus itself; for certainly if the poison producing it could exercise its morbific influence on individuals labouring under other complaints, there is no reason why it could not appear in its pure form when attacking others free from such complaints. Add to this typhoid fever existed extensively in the English army, whose proximity to the French renders improbable the supposition that the cause existed among the former and not among the latter. If it prevailed less generally in the one than in the other, the explanation may probably be found in the fact, that the typhus poison, which, as we shall see presently, spread to an almost unprecedented extent in the former, without chasing away completely the typhoid, overshadowed the latter to a great extent, its product becoming paramount, and taking the place of that which continued to prevail almost exclusively in the English camp, attacking many of those who, in its absence, would possibly have suffered from the other disease, and becoming the principal element of complication.

*Typhus.*—Of all the diseases which affected the French army, none produced more disastrous effects—at least during the latter period of the campaign—whether under the walls of Sebastopol, at Constantinople, or in other places occupied by the troops, than typhus fever. The first mention of it as making its appearance about the besieged city comes from M. Scrive, who informs us that on the 24th of December, 1854, he visited the village of Karani, near Balaklava, and there recognized cases of one of the forms of typhus, to which the Turks give the name of *havavou-rouchou* (p. 135). In the monthly report for December the admissions

of typhus are noted. No mention being made of the disease in the like reports for October and November, we must conclude that it first broke out among the troops in December, when the cases amounted to 86, with a mortality of 10. During the next month, January, 1855, the number of cases rose to 154 (16 deaths). In February it reached 250 (26 deaths), and in March fell to 82 (14 deaths). From this period it went on diminishing, though irregularly, until November, when the number was reduced to 10 (6 deaths). (July giving 69—12 deaths, and April 61—8 deaths.) In the following December the disease broke out afresh in the most alarming manner; the admissions that month reaching 711 (323 deaths)—the number remaining in hospital on the 1st being 157. January furnishes 1,523 cases with 464 deaths. February 3,402 with 1,435 deaths, and March 3,457 cases with 1,830 deaths. In a word, while during the first year, from December, 1854, to November, 1855, inclusive, embracing therefore the whole winter, the number of admissions of typhus cases in the Crimean hospitals did not much exceed 700; the returns of the next four months exhibit the enormous amount of 9,116 admissions, with a mortality of 4,052. Of the balance, 794 were discharged cured; 2,589 were sent to Constantinople (where, as also on board of the transports, many died), while 1,838 cases remained in hospital on the 31st of March.[1] From the 15th of this last mentioned month to the 15th of June following, the returns of the typhus cases in the Crimean army give the following figures, which we place in tabular form.

| Dates. | Remaining. | Admitted. | Sent to Constan'ple. | Cured. | Died. |
|---|---|---|---|---|---|
| 15th March . . . | 1,463 | 88 | 24 | 16 | 64 |
| 1st April . . . | 1,907 | 110 | 28 | 50 | 51 |
| 15th April . . . | 1,112 | 77 | 21 | 12 | 26 |
| 1st May . . . | 928 | 60 | 30 | 6 | 24 |
| 15th May . . . | 534 | 31 | 9 | 3 | 13 |
| 1st June . . . | 298 | 7 | 26 | 5 | 4 |
| 15th June . . . | 106 | 0 | 2 | 0 | 2 |

From what proceeds it is seen, that during the Crimean campaign, the French army passed through the ordeal of two epidemics of typhus fever. The one commencing in the Crimea during the cold weather of December, 1854; the second during like weather in December, 1855. From this place the disease spread to the troops and hospitals in Constantinople one month after its appearance in the Crimea, *i. e.*, in January, 1855, and January, 1856.

All the French hospitals were there invaded. Those of the plateau extending from Ramis-Chiftlik to Daoud-Pacha; the hospital of Candilie on the Bosphorus suffered severely. In fact, of twenty hospitals and ambulances located in and about Constantinople, not one escaped. Subsequently it invaded the establishments situated at Gallipoli, Nagara, and on the Dardanelles. It appeared and committed considerable havoc in the camps of Maslak and Daoud-Pacha, on board of ships of war and transports, and in the large prison pontoons stationed at the Golden Horn, as also in the long line of tents pitched along the terrace situated between the old Byzantine ramparts and the fosse nearly opposite Maltepa and Daoud-Pacha, and the barracks of Foudoukle. Finally, it was carried to the

[1] Scrive, 278.

hospitals of Marseilles, Toulon, Porquerolles, Frioul, Avignon. It reached the hospital of the Val de Grace in Paris, Chalon, Neuchateau, &c. In the aforesaid hospitals and establishments the number of cases admitted during the first six months of 1856 amounted to 7,130, with a mortality of 2,995—the number remaining on the 1st of January being 28, and on the 30th of June, 38.[1]

"From official documents," says Mr. Jacquot, "the culminating point of the epidemic of 1854–5, as it existed everywhere, was attained in May and June, and succeeded to a period of increase, embracing the first four months of the year. This was followed by a period of decrease commencing in July and continuing through August."

Mr. J. thinks that the ultimate period should embrace April, and perhaps a part of February, inasmuch as the disease prevailed considerably during those months, though many cases were not, through ignorance of their true nature, reported as such. To this he adds that although the disease ceased as an epidemic at the time mentioned, it never disappeared completely, but continued to show itself sporadically between the two epidemics, and also after the close of the second, which finally took place at the end of June.

It may be mentioned here before closing this part of the subject, that the fever in question prevailed to some extent among the Sardinian and Turkish troops. Among the Russians it broke out towards the end of autumn or the beginning of winter, *i. e.*, after the army had left Sebastopol and were encamped in the valleys—when the hospitals being overcrowded with paludal cases, the fever was therein developed and spread widely. It extended its effects to Sympheropol, Odessa, Nicolaieff, where there was the like overcrowding. In some of these places it spread among the inhabitants.[2]

The whole number of cases which occurred in the Crimean army, as reported by M. Scrive (p. 345), amounted to 11,124—711 the first winter, and 10,413 the second (*ib.*). The mortality among these amounted to 6,018—329 during the first winter, and 5,689 during the second (p. 245). The average strength of the army being, during the first of these periods, 90,000, we have a proportion of 1 case in 128. During the second period the average strength of the troops had reached 140,000. The cases being 10,413, we have a ratio of 1 case to $13\frac{3}{10}$th; and during the combined periods of the two epidemics, of 1 to $70\frac{7}{10}$th. During the two epidemics the mortality was 1 in 2—1 in $2\frac{3}{10}$th during the first, and 1 in $1\frac{8}{20}$th during the second.[3]

The following tabular view presents a monthly return from September, 1854, to the beginning of July, 1856, of the number of troops in the Crimea, as also of that of the cases of typhus, and the mortality arising from it, from Dec., 1854, to May, 1856, when the disease ceased as an epidemic.

[1] Jacquot, 50.
[2] Alferiff in Disc., 125–6. Jacquot, 60, 61.
[3] Scrive, 346.

| Dates. | | No. of Troops. | Cases of Typhus. | Deaths. |
|---|---|---|---|---|
| 1854. | September | 38,030 | ... | ... |
| | October | 46,237 | ... | ... |
| | November | 56,179 | ... | ... |
| | December | 65,237 | 86 | 10 |
| 1855. | January | 78,502 | 154 | 16 |
| | February | 89,308 | 250 | 26 |
| | March | 96,165 | 82 | 14 |
| | April | 91,258 | 61 | 8 |
| | May | 107,760 | 10 | 4 |
| | June | 121,887 | 0 | 4 |
| | July | 118,655 | 69 | 12 |
| | August | 119,251 | 20 | 13 |
| | September | 125,680 | 5 | 3 |
| | October | 138,532 | 11 | 5 |
| | November | 143,250 | 10 | 6 |
| | December | 145,120 | 734 | 323 |
| 1856. | January | 144,512 | 1,523 | 464 |
| | February | 132,793 | 3,402 | 1,435 |
| | March | 121,000 | 3,457 | 1,830 |
| | April | 105,000 | 93 | 174 |
| | May | 67,000 | | |
| | June | 25,000 | | |
| | July (6 days) | 5,000 | | |

On this subject it must be remarked that the average proportion of cases to the number of troops exposed to the influence of the typhous poison, as also that of deaths to the number attacked, thus mentioned, has reference only to the totals of admission of the disease when developed spontaneously in the regiments, and reported as such; as likewise to the mortality occurring among such cases. To form a correct idea of the full extent of the spread of the disease, and of the entire mortality to which it gave rise, we must, as M. Scrive states, add, 1st, the large number of deaths which occurred among individuals affected with and admitted for other diseases—dysentery, scurvy, fevers, wounds—and who were subsequently attacked with and died of typhus. These, M. Scrive (p. 274) says, far exceeds the others. So numerous, indeed, were they, that he thinks himself justified in estimating the whole number at from 18,000 to 20,000. 2d. The deaths which occurred from the same cause in Constantinople and France, among the men who took the disease in the Crimea, and were carried thence while sick, or who sickened after their arrival.

M. Scrive remarks that, in elucidating the excess of mortality which occurred over that noted in ordinary times, during the prevalence of typhus in the Crimean ambulances, he finds that the number of such secondary and communicated cases may be estimated at 4,502. We may, he adds, estimate approximately at 7000 the mortality at Constantinople and in France. This will give us a total mortality from the disease in question of 17,515; which corresponds to a total of 35,000 cases.

This is not, we think, an over-estimate of the extent of the disease, and of the mortality to which it gave rise among the French troops. It is true that it appears to exceed greatly the items furnished by Baudens, who in a tabular return of the movements of the hospitals and ambulances of the Crimea, Constantinople, and Turkey, from the 10th of April, 1855, to the evacuation of the country, early in August, 1856, lays down the whole number of cases at 13,540, and of deaths at 7,516. But by the same return the number of unspecified fevers is computed at 112,287, with a mortality of 18,360.

May we not presume that a very large number of these were in reality cases of typhus, reported under the simple appellation of fever or typhoid fever, owing to a false appreciation of their true nature?

The same M. Baudens does not hesitate to proclaim, both in articles he published in the *Revue des Deux Mondes* and in his volume, already so often referred to, that the invasion of typhus fever in 1855 constituted the greatest disaster the French army encountered during the Eastern expedition, and which subjected it to the worst and most painful of the many trials it was compelled to undergo. Cases of the disease constituted in February of that year, he says, one-fifth of all the sickness then prevailing; amounting to 40,000 in the Crimea and in the Bosphorus, of which one-fifth, or 8,000, were doomed to die. "People speak with dismay of the plague of Egypt in 1792 (1799?). Agreeably to the most exact information, as we are informed by the illustrious Desgenettes in his *Histoire Médicale de l'Armée d'Orient*, the epidemic carried off about 700 men. Our typhus caused ravages of a much more disastrous kind" (p. 260).

Be this as it may, we find from the tabular return published by M. Scrive (p. 485), that the number of typhus cases treated in the hospitals of Constantinople amounted to 8,739 (3,840 from Varna and the Crimea, and 4,889 originating in the place), and that the mortality did not fall short of 3,407 Under the head of feverish (fièvreux) we have a total of 71,152, with a mortality of no less than 12,549, or 1 in 5.6. What fever but typhus would contribute to raise the mortality so effectually as to furnish such a high per centage? According to another authority, M. Jacquot (p. 63), the military hospitals at Constantinople, alone, received, from Jan. 1st to June 30th, 1856, 7,102 cases, and experienced a loss of 2,995, or a little less than 1 in 2. Add to this that many cases occurred at Gallipoli, Nagara, Maslak, Ramis-Chiftlik, and that many deaths occurred there—that the disease spread to the war ships and transports—that for a time 200 died every day, between the Crimea and Constantinople (*Baudens*, 275), and that the disease accompanied the army to France, and caused there and in the vessels transporting the troops thence many deaths; and we shall feel disposed to give full credence to the statement of M. Scrive.

The latter author states that the ratio of admissions into the hospitals of the Crimea to the effective strength of the army, from October, 1854, to October, 1855, was 1 to 10; and that of deaths to cases was also 1 to 10. But during the four months of the winter of 1855–1856, the number of cases admitted was in the ratio of 1 to $11\frac{3}{10}$ of the strength of the army, while the ratio of deaths to the sick reached 1 to $5\frac{4}{10}$. This loss had never before been experienced but in the month of June, rendered memorable by great military events, and the simultaneous prevalence of cholera in an epidemic form. The mortality from pure typhus, during that time, was greater still, being in the proportion of 1 death to $2\frac{3}{10}$ cases. "And in this estimate we do not take into account the large number of patients sent to Constantinople, and who, either during the passage or in the hospitals of that city died of the disease, and thereby add a large contingent to the amount of the mortality" (279).

There can be no doubt, judging from the description we have of the symptoms, pathological lesions, efficient or productive causes, mode of progression, &c., of the disease here referred to, that it is fairly entitled to the name of typhus, in other words, that it differs in no essential respects from the fever known everywhere under that appellation, and should not be confounded with any other febrile affection.

On this question opinion can scarcely differ among those who carefully examine the posthumous volume of M. Jacquot and various other writings on the medical history of the Crimean expedition, issued by the army physicians, and particularly the interesting account of the proceedings of the *Imperial Medical Society of Constantinople.* In the latter volume will be found recorded *in extenso* the sentiments on the subject not only of a large number of the French members of that society, whose ample experience in the disease, and intimate knowledge of the pathognomonic character of the only fever with which it could well be confounded—the typhoid—entitled their views to entire confidence; but also of several English, Russian, Austrian, and other physicians, who carefully observed the disease in the French and other hospitals. With the medical corps generally, in and out of the society, the question of the distinct typhus nature of the disease does not appear to have been held in doubt; few, if any, advocating the opinion that the fever was nothing more than the common typhoid; for, though admitting that the latter showed itself in numerous instances, they maintain that, in the vast majority of cases, the disease they encountered presented a different aspect, and approximated itself to the fever described by Hildenbrand, Pringle, and hundreds of others; in other words, to the true typhus, camp, hospital, or ship fever, modified, it is true, by a variety of morbific influences, so as to assume several forms during the course of the same season, and especially at its several epidemic recurrences; but still, nevertheless—so to say—a distinct homogeneous individuality—the true typhus.

Nor is it only from the observations collected in the French hospitals that the opinion of the true typhus nature of the fever is founded. Dr. Alferieff, who was commissioned by the Russian government to investigate the character and causes of the fever prevailing among the troops, and saw much of it at Odessa, subsequently visited the Crimea and Constantinople, where he had ample opportunities of observing the existing epidemic. He fully recognized the identity of the disease in these different places. Now what does he say respecting the fever among the Russian soldiers? In the report of the remarks he offered at a meeting of the Medical Society of Constantinople, we are told:—

"M. Alferieff found perfect the description of typhus as given by Hildenbrand. It is only necessary," he says, "to change a few terms which were in harmony with the state of the science at the time he wrote, but are no longer so with the progress the latter has since made. The epidemic of the Russian army presented all the traits given by Hildenbrand in his description" (p. 126).

Certainly no one who reads this description will refuse to admit that though this celebrated writer regarded as, and included under the generic term of typhus, some forms of febrile complaints which the investigations of modern pathologists have shown to be distinct in point of causation, symptomatology, and anatomical lesions, from that disease; though his description embraces, as belonging to a variety of typhus, cases which we cannot regard otherwise than as typhoid, the disease he had principally in view, and which constituted the basis of his work, was the true typhus; and if such was the form of fever prevailing in the Russian hospitals, we cannot suppose, even were we not fortified by the testimony of M. Alferieff, that the French troops suffered at the same time from a different febrile complaint. In the English army, too, numerous cases occurred during the first season of the war, more particularly when the usual causes of typhus

infection exercised their influence to a considerable extent, which were readily recognized as true typhus by the attending physicians, who, from their antecedent knowledge of this disease, were fully able to decide on a question of the kind. The presumption naturally is that the disease which affected one camp was the same as that prevailing in the other. The fever, it is true, appeared in, and also disappeared from, the English before it did from the French hospitals, and scarcely prevailed in the former hospitals at the time it was spreading extensively in the latter. But this is easily explained by the well-known fact that the causes of the disease which, at first, did not exist so extensively among the French as among their allies, increased among the former while they abated among the latter; and that during the second winter they attained frightful proportions in the French camp and hospitals, while they had disappeared completely in the English. Add to this that the English physicians, who observed the fever affecting the French army, pronounced it to be typhus. We may mention in connection with this subject, that the cases of the Crimean fever imported into Toulon and other ports of France, where typhus is well known, were recognized as such, and not as anything else; and that those that reached other places where the disease is not usually seen, but where typhoid fever is familiar to every physician, they were regarded as different from the latter. But we need not prosecute this subject any further. Taking all that precedes into consideration, we may, indeed, regard M. Baudens as speaking in the name of the large majority of the medical officers of the army, when he tells us:—

"The typhus of the Crimea has definitely settled the question of the identity or non-identity of the two diseases. It is no longer possible to confound them together, although they present more than one link of parentage, and an apparent community of origin" (p. 229).

But although the many physicians who have expressed their views on the subject, orally or in writing, have arrived at the conclusion that in a large number of the fever cases observed in the Crimea and in the hospitals of Constantinople, the disease was of the kind mentioned, some few among them feel disposed to differ from their colleagues, and among them may be cited a writer of high authority—M. Cazalas—who not only refuses to recognize any difference, except in regard to degree of violence, between typhus and typhoid fevers, but maintains that in his hospital at Constantinople he saw no true typhus—nothing but typhoid phenomena due to an accident superadded to some other disease—a mixture of divers morbid ailments, among which the malarial element played a conspicuous part.[1]

M. Cazalas, however, does not seem to have made many proselytes to his views, though, as we have seen, all agreed in the fact, that in many cases the malarial, typhoid, and typhus poisons combined together, and thereby produced hybrid diseases. But, in the majority of cases, no such combinations existed, and the distinctive characters and the purity of the fever were easily made out during life, and confirmed by the morbid changes revealed on dissection, as well as by a consideration of the external agencies through the influence of which it arose, its mode of propagation, &c.

We need not, and cannot, from want of room, enter fully on the subject, and must content ourselves with the following statements derived from competent authorities, which, we think, settle the question—showing, as they do

[1] Discuss., p. 25.

clearly, the principal points of dissemblance existing between the disease in question and typhoid fever, and, on the other hand, the identity of the former with true and indubitable typhus, as it has been observed, carefully studied, and described elsewhere. It is proper to premise, however, with a view to render still more evident the correctness of the conclusion to which these statements lead, that the duration of the Crimean fever under consideration, was considerably shorter than that of the typhoid, and similar to that of ordinary typhus; that the same remarks are applicable to the duration of convalescence; that, similarly to what occurs in true typhus, the course of the disease, in the Crimean fever, was more irregular than in typhoid fever, the attack more sudden and abrupt, the forms assumed more varied; while many of the symptoms of typhoid fever—sudamina, epistaxis, coma, gargouillement, diarrhœa, &c.—were either totally absent in the other, or appeared seldom and with less intensity. Dr. Bryce, who saw much of the disease, tells us that in the typhus studied in the French hospitals, as elsewhere, there were present the characteristic maculæ and petechiæ very distinguishable from the rose-coloured papulæ of typhoid fever. In the former there were absent the abdominal symptoms so prominent, and almost pathognomonic of the latter. Equally absent were the anatomical lesions which constitute the character of simple continued fever—namely, morbid states of the intestinal follicles, mesenteric ganglions, and spleen.

"Moreover," Dr. Bryce continues, "the identity of our home-bred typhus with the typhus of the French camp is shown—1st, in that both have their origin and development under the influences of the same concurrent causes, which are over-crowding, accumulation of filth, starvation, and wretchedness; 2d, that both have the like modes of attack, the same characteristic eruptions, similar incidental complications, run a parallel course, and present analogous critical phenomena; lastly, both are potentially infectious, and essentially functional disorders: that is, communicate by human intercourse, and have an existence independent of, and are capable of proving fatal without any appreciable local or structural lesion" (pp. 108–9).

Convincing as the foregoing statement is to us, and conclusive as it was to the majority of the physicians who encountered the disease at or about the close of the war, it would appear that at the outset of the epidemic, and indeed for some time after, its true nature was by some of the medical officers of the army—especially at Constantinople—misunderstood, and that the cases were reported under different heads. According to M. Jacquot, the typhus of 1855 did not exactly resemble that of 1856:—

"It would seem," he says, "as if it had experienced some difficulty in establishing itself, or at least in assuming a control over other diseases, and presenting a distinctness of symptomatology calculated to allow it to be readily recognized." He acknowledges that some time, indeed, elapsed before its identity was made out; and that the period of decision would have been still longer delayed had it not been for the authoritative declarations of M. Levy, medical inspector, and soon after of M. Fauvel, sanitary physician at Constantinople, who discovered the nature of the epidemic.

At the origin there were as many accidents—typhic states—associated with other affections, as typhus fever cases, properly so-called; and these accidents which were thus added to divers diseases, consisted at times of a tolerably complete combination of typhic phenomena; at other times of isolated kindred phenomena. In one case there was hebetude; in another, flighti-

ness at night—here inflamed parotids—there persistent headache, cutaneous eruptions, &c.

In 1856, the disease from the outset in January, though assimilating itself somewhat to the epidemic of the preceding years, assumed rapidly an independent and well marked individuality. The cases became more uniform, and finally appeared as if having passed through the same mould (p. 318). But whether recognized or not, as early as January, as may be inferred from the statement of M. Jacquot, it would appear from a numerical return furnished by Dr. Bryce (p. 97) of the diseases treated in the hospitals of Constantinople during the months of January, February, and March, 1856, that typhus fever does not figure in the first of these months, and was only formally registered in February, when not less than 3,489 cases were reported. Of course, many cases of real typhus existed there during the previous months, but were registered under some other denomination. This delay resulted, it is alleged, from compliance with the nomenclature made use of in the Crimea. Previously the fever was marked on the books and bed tickets by some insignificant or inappropriate terms, typhic or typhoid state, typhoid fever, &c. This erroneous proceeding, however, was not intentional on the part of those who committed it. On this subject Dr. Bryce says:—

"In casual visits to the French hospitals last summer, I noticed many cases of fever marked on the bed tickets as typhoid, or more indefinitely as *état typhoïde* or *typhique*, which English physicians would unhesitatingly have pronounced common typhus. Presuming this nomenclature to be more significant of political reserve than indicative of medical diagnosis or knowledge, I gave little heed to the circumstance. It was not till a later period, when placed in responsible clinical contact with the sick, and familiar communication with the French medical staff, that I fully comprehended the amount and sincerity of the discrepancy which existed, and had always prevailed among scientific observers, respecting its true nosological place. It is acknowledged by Mr. Thomas, that the same affection abounded in the hospitals during the winter of 1854–5; and that, losing some of its intensity last summer and autumn, it reappeared this winter under similar conditions, and with similar symptoms to the preceding. The French surgeons, nevertheless, continued to dispute its nature; and up to the present moment several able papers have been read, and four public discussions taken place at meetings of the Imperial Medical Society here, most numerously attended, to elucidate and determine the question of its identity with typhus. It is thus made known that some writers and speakers consider the epidemic to be a variety of typhoid fever (entérite folliculeuse, &c.), others, malignant remittent fever; the majority pronounce for the true typhus of camps and cities. The error is excusable in French practitioners, who have had very rare opportunities of seeing typhus in their own country."

Dr. Bryce could have no hesitation in regarding cases so registered and considered as instances of the disease in question.

The typhus of the Crimea did not always present itself in its pure and unadulterated character. Indeed, while it almost invariably associated itself with all the prevailing complaints, thereby imposing, to a greater or less extent, its character upon them and aggravating their fatal tendencies, it was itself very frequently complicated with scurvy, thoracic inflammations, remittent fever, cholera, diarrhœa, dysentery, and even with typhoid fever and hospital gangrene.

As regards the question of the origin and mode of transmission of the disease, the French medical officers, and such of the foreign physicians as visited the hospitals placed under their charge, seem to have been almost

unanimous. Differing, in toto, on the first of these points from M. Boudin,[1] a high authority in France on all matters connected with military medicine and hygiene, and some other French writers, and Bancroft, Watson, and others, in England, who deny the spontaneous origin of typhus under any circumstances, and place the disease on that point in the same category with smallpox and measles, the Crimean physicians held, that the fever they were called upon to treat could be traced to no appreciable foreign cause, but arose from the action of local and removable causes—overcrowding, animal exhalations, filth, defective aeration and ventilation, fatigue, gross and unnutritious diet, aided by depressing and continuous affections of the mind, loss of sleep, &c. Such was the belief, with one exception,[2] of all the members of the Imperial Med. Soc. of Constantinople, who took part in the discussions held on the subject, and whose views are recorded in the Transactions of that body[3]—Quesnoy (p. 43), Valette (p. 39), Arnaud (pp. 60, 118, 119), Garreau (p. 64), Grellois (p. 100), Roux (pp. 110, 111), Sotto (p. 112), Fauvel (pp. 166, 182); as also of Jacquot,[4] Baudens,[5] Scrive,[6] Cazalas,[7] Bryce;[8] some of whom recorded their views on the same occasion, and subsequently issued them in separate publications, to which we have so often referred.

Nor was there much difference of opinion relative to the mode of propagation of the disease. All or nearly all the physicians who encountered it, either in the Crimea, in Turkey, or afterwards in France and Algiers, maintained that when once arising through the influence of the causes mentioned, it was transmissible to the healthy, or to individuals labouring under other complaints, or through exposure to, or residence in hospitals or ships containing, or having recently contained large numbers of patients affected with the fever—such physicians attributing the effect to emanations, specific or otherwise, from the sick; in other words, to contagion, either direct from body to body, or, as was more generally believed, indirect, through the medium of a polluted atmosphere. In illustration of the diffusion in that way, M. Jacquot states, on the authority of the Superior of the Sisters of Charity of the Convent at Galatia, that out of about 150 Sisters employed in the service of the military hospitals, from the 1st of February to the 1st of June, 75 were attacked with typhus, properly so called, and that of these 15 died. The mortality among the chaplains and physicians was very large. On the 17th of March ten of the attendants in the hospital of Pera were seized with that disease. In M. Jacquot's own wards, twelve of the attendants were at one time under treatment for the same (p. 95). M. Baudens saw it in some of the hospital wards communicated from bed to bed, and attack individuals who, before the arrival near them of a typhus patient, were labouring under some trifling complaint. In a particular instance cited by him the fever spread to all the attendants. Fifteen physicians out of sixteen were attacked, and none of the nurses escaped (p. 229). Dr. Bryce states that in 57 days of January and February, 1856, 603 out of 840 orderlies on service in 12 hospitals were attacked with typhus. On the 15th March there were in the hospitals of the Russian embassy (officers' hospital)

[1] Traité de Géographie et de Statistique Médicale, ii. p. 486.
[2] Dr. Zenaro.
[3] Discussion sur le Typhus Observé dans les Armées pendant la Guerre d'Orient. Constantinople, 1856.
[4] D. 29—Wk. 305. [5] 230.
[6] 135, 270, 295, 407, 8, 9, 412. [7] xv. xvi. D. 3. [8] p. 109.

31 surgeons in different stages of typhus, and only one army officer, also five priests attached to the hospital service of Constantinople. Finally, of the whole medical staff who served with the French army from the time of its arrival at Gallipoli in 1854, down to 28th April, 1856, numbering about 350, 72 fell victims to their professional duties, that is, twenty per cent., being three times the proportionate loss of the officers of any other service from all causes (pp. 111, 112).

But general as this belief in the contagious nature of the disease, based on the facts mentioned and others of like import, evidently was, several of the medical officers of the army, most conversant with the history of the epidemic, appear disposed to deny that the fever exhibited evidence of contagion in the strict acceptation of the term. Among these dissentients may be cited M. Netter, whose position as hospital physician enabled him to see much of the disease. In the course of a discussion which took place at the Medical Society of Constantinople, M. Netter referred to several remarkable instances of exemption from the disease, which could not have occurred had the latter been really endowed with truly contagious properties. We have room but for one of these:—

"The number of Sisters of Charity employed in the hospitals of Constantinople from the 1st of January to the 30th of April, 1856, was 160, of whom 68 were attacked with typhus. Of the latter, 14, of whom 5 died, were treated in the hospitals. The 54 others were treated in the infirmary of Nôtre-Dame de la Providence, and furnished 6 deaths. The first was admitted on the 1st of February, and on the 30th of April 12 remained under treatment. Of the 36 Sisters employed in the service of the infirmary, 30 of whom watched alternately their sick companions during entire nights, not one contracted the disease. There was not, therefore, a single case of contagion in the establishment" (p. 71).

From this and other facts observed by him, M. Netter concludes that typhus fever is the result of a miasmatic poison, which is first produced in the atmosphere through the agency of some form of organic matter, and subsequently multiplied by means of a process of fermentation whenever placed in contact with matter of the same kind. "Originating in the Crimea," he says, "this miasm was carried to the hospitals of Constantinople with the products of the secretions of the sick, products which were accumulated in the mattresses, coverlids, in the flooring, &c." Hence the hospitals became so many foci of infection, while the civil establishments, kept in a cleanly manner by the Sisters of Charity, remained inoffensive to the last (p. 72). If this theory is correct, it follows that the disease is not the product of a specific, secreted, and non-preventable contagious poison, but often arises spontaneously from the operation of a miasm, due to certain animal exhalations, secretions, discharges, &c., issuing from the bodies of individuals in health or sick, more especially from the latter when affected with adynamic diseases, when concentrated in overcrowded, ill-ventilated, filthy habitations; or arising from noxious effluvia having a different and external origin; that this miasm may be, and is often, carried far from its original place of development by various agencies too well known to be mentioned; that it has a tendency to multiply itself and extend its effects, whenever it meets in its new abode with conditions similar to those through which it was created, but that unlike true specific contagions it may, being no longer, if it ever was, connected with the body, be prevented or removed by the employment of judicious hygienic measures.

The opinion of M. Netter on the subject in question does not differ

essentially from that expressed by some of his colleagues; for though these may talk of the disease being endowed with contagious properties, it is easily perceived that they use the word contagion in a very indefinite sense; that with them it means little more than the vague expression of the existence of a power of transmission, by virtue of which the disease is communicated to the healthy or to individuals affected with other complaints, when these, under certain contingencies, are placed in the vicinity of the sick or in localities in which such sick were recently and for some time confined; and that they in no instance show that this power of transmission is due to a specific poison formed in the body of the sick and independent of external morbific agencies, as is the case in diseases truly contagious. But be this as it may, as regards the approximation of the views of these physicians to those of M. Netter, there can be no doubt that the latter will be found closely allied to, if not perfectly identical with, those suggested some ten years ago by the writer of the present article.

It may be mentioned in this connection, that however transmissible the disease may be admitted to have proved within the precincts or wards of the hospital establishments of the Crimea, Turkey, or elsewhere, it did not extend beyond. The greater number of these establishments, it is true, were isolated; but such was not the case with all. Thus, the hospital of the Medical School at Constantinople was situated on one side of the street, while the other side was occupied by the civil population. The civil hospital of Pera and the military hospital of the Russian embassy were in the centre of populous quarters of the city, and were nearly touching some private houses; and yet, notwithstanding, the disease did not spread. In the Crimea, tents and barracks occupied by officers were spared, though placed amid those of soldiers among whom the fever prevailed extensively and fatally.

To this rule few exceptions may be pointed out, but they will be found to have occurred, according to M. Jacquot, in besieged towns or closely blockaded places, as in Tchistinakeia near Sympheropol, where the sick were located in almost close contact with the civil population.

R. La R.

ART. XVI.—*Histology of the Spinal Cord.*

1. *Researches on the Development of the Spinal Cord in Man, Mammalia, and Birds.* By J. LOCKHART CLARKE, F.R.S. From the Philosophical Transactions. Part II., 1862. 4to. pp. 28. With 4 plates.
2. *Notes of Researches on the Intimate Structure of the Brain.* Third Series. By J. LOCKHART CLARKE, F.R.S. From the Proceedings of the Royal Society. Vol. XII., No. 57. 8vo. pp. 7.
3. *A case of rapid "Wasting Palsy" from Structural Disease of the Spinal Cord.* By J. L. W. THUDICHUM, M. D.—*The Investigation of the Nervous Centres with Comments.* By J. LOCKHART CLARKE, F.R.S. From Dr. Beale's Archives of Medicine. No. XIII., 1863. 8vo. pp. 22. With 5 plates.

To Bidder and Kupffer, and still more recently to Kölliker, we are mainly indebted for our knowledge of the histology of the development of the spinal cord in birds and the higher animals. Their investigations have led them to the following results:—

"1. After the closing of the laminæ dorsales, the cord at first consists of a canal, the walls of which are composed of cells of one uniform kind, and disposed in a radiating form.

"2. In the next place, this wall of cells divides into two layers, of which the outer forms the gray substance, while the inner one appears as the lining of the central canal.

"The white substance makes its appearance later than the gray, by the cells of which it is without doubt furnished as an outer layer or covering. The white columns are four in number, two on each side; and to these a white commissure is added. There are no lateral columns; those which are so called are subsequently formed as an extension of the anterior columns."

In the *Philosophical Transactions* for 1859 Mr. Clarke showed that, in the adult spinal cord of man and all vertebrate animals, the white columns as well as the gray substance are everywhere interspersed with granular nuclei, of which some are attached to the sheaths of the primitive nerve-fibres, while others are imbedded in the intervening connective tissue. In the gray substance these nuclei are more abundant than in the white, and have much resemblance to many of the free nuclei or cells, which are certainly in connection with nerve-fibres, and with which they are freely intermixed. To the study of the development of these nuclei Mr. Clarke has devoted much time and attention with the hope of determining the histological relation which they bear to the other elementary tissues of the cord. We could not with advantage to our readers follow him into the minute details of his elaborate researches, without constant reference to the explanatory plates with which the memoir on the spinal cord is illustrated. From the concluding pages of this memoir, however, we borrow the following statements which exhibit in a general manner the conclusions to which our author has been conducted by his admirable labours:—

"We have seen that in its earliest stage of development, the spinal cord consists of a canal surrounded only by one uniform or homogeneous layer of small cells or nuclei, which are not distinguishable from each other in appearance, and

are so closely aggregated as to seem in actual contact. To call this single layer the epithelium of the cord, appears to me about as incorrect as it would be to call the germinal membrane of the ovum the mucous or internal of the two layers into which it immediately separates; for in the second stage of its development, we find that this single and homogeneous layer constituting the entire substance of the cord, while it continues to increase in depth, undergoes a differentiation into two distinct layers—an inner, constituting the true epithelium, and an outer, constituting the gray substance; and although the former does not undergo the histological and morphological changes which subsequently take place in the mucous layer of the germinal membrane, yet it is probable that *after* the production of the outer or gray substance, it differs in its histological character from the originally homogeneous layer. This differentiation of structure proceeds very gradually, and is not at first marked by any decided line of separation, or by any difference in the appearance of the structural elements. At the same time there is gradually formed around, and apparently secreted from, the small cells or nuclei, a granular substance that forms into processes or fibres, and constitutes a continuous network by which all the nuclei or cells of both layers are uninterruptedly connected. In the gray substance itself there is no apparent difference in structure between its anterior and posterior portions, although in each portion darker and more-closely aggregated groups of nuclei may be observed in connection with the roots of the nerves. But as development progresses, a diversity of structure ensues; for while the nuclei of the *posterior* gray substance, although rather more granular than at first, have scarcely advanced in size, those of the *anterior* substance have increased to double their original diameter, and are connected by thicker fibres, which form a coarser and more granular network. At the same time, around the separate groups of the latter substance, the granular network between the nuclei assumes a more sponge-like structure. Meanwhile, within the group, there are formed from the nuclei a number of large, roundish or irregular but adjacent cells, with thick nucleated walls. It is quite evident that the nucleated tissue constituting the walls of these cavities and the network around them is in every respect similar in appearance to that which is very commonly assumed by the connective tissue of parts external to the cord.

"It appears, then, that in these early stages of development there are at least two kinds of free nuclei in the gray substance of the cord. The one kind appear to develop the general network of tissue which pervades the entire structure, but proceed no further; whereas each of the other kind, while connected with this network as well as with nerve-fibres, develops a nucleated cell with a nucleated wall which is still connected, and ultimately blended, with the surrounding reticular structure. In the cells of the intervertebral ganglia, although the process appears to be *essentially* the same, there is some difference in the appearance they present in the earlier stages of development. As development advances, these nuclei or small cells of the intervertebral ganglia simply enlarge, at first, but at the same time are connected with each other and with intervening granular nuclei by fine fibres. At a later period a very distinct and well-defined nucleus, surrounded by a variously-shaped granular mass, makes its appearance within each cell; while its surface becomes the cell-wall, which at first is thin, but gradually increases in thickness. Now the surfaces of these cells are in connection not only with the intervening nucleated fibres which are continuous with the connective tissue forming the sheath of the ganglion, but also with the walls of the adjacent bloodvessels; and it is probably through the medium of this nucleated tissue that the developing cells are supplied with nutritive fluid. Indeed, if we except the muscular fibre-cells, with which some of them are provided, the walls of the bloodvessels are only a part of pia mater and connective tissue between them. On examining the layer of pia mater which immediately surrounds the cord, it may be seen to connect the walls of the bloodvessels which it contains with the sheaths of the intervertebral ganglia, and, through this, with the sheaths of their nerve-cells, on one side, and on the other side with the connective tissue or pia mater within the cord itself. Since the sheaths of the nerve-cells have been shown to be continuous with, and indeed to form a part of, the reticular connective tissue of the cord, which is itself continuous with the pia mater of

the surface, it is evident that the processes of the epithelium, the pia mater and connective tissue within the cord, the walls of the bloodvessels, and the sheaths of the nerve-cells must be all uninterruptedly continuous with each other. But the sheaths of the nerve-cells are certainly connected with the surfaces of their granular contents; and in the fully-developed cord, where the cell-sheaths are much finer and thinner, processes from the cells are continuous by fine subdivisions with the surrounding reticular structure. These observations, then, appear to throw important light on the question which I formerly proposed, as to whether there is any actual and essential difference between the connective and the true nerve tissue, or 'whether the connective tissue of the cord be intermediate in its nature, passing on the one hand into *nerve*-tissue, and on the other into *pia mater*.'[1] We have seen that the cell-sheath or wall is the product of, and indeed is constituted by, the very surface of the primitive nucleus or cell, and that, while it ever after remains in connection with its contents, it forms a part of the surrounding connective tissue, which is itself a prolongation not only of the pia mater of the surface, as well as the walls of the bloodvessels, but also of the processes of the epithelium. But although there is this uninterrupted continuity between all the constituent elements of the cord—although, perhaps, the nerve-tissue actually changes by insensible degrees into the tissues with which it is continuous—and although the cell-wall, which forms part of the surrounding reticular structure, is a product of the primitive nucleus, there is yet no ground for believing that the connective tissue, as such, can ever develop itself into nerve-tissue, any more than that any one of the differentiated parts of a fully-developed organ can reproduce the entire structure; for the nerve-cell, although it develops from itself its own sheath, which forms part of the nucleated connective tissue, produces something more than this tissue, viz., the granular contents of the cell.[2]

"We know that the processes of the nerve-cells constitute the axis-cylinders of the vasomotor nerves distributed to parts external to the cord; and therefore it seems probable that the finer processes which are lost by subdivision in the pia mater or connective tissue within the cord are the means of transmitting nerve-power to that tissue and to the coats of its bloodvessels, from which, by their uninterrupted connection with them, as already shown, the nerve-cells in return receive their supply of nutriment."

The second of the three papers under notice is occupied with an account of the minute anatomy of the cerebral convolutions, the valve of Vieussens, and the cerebellum, together with a description of the course of the fibres of the central white substance of the brain through the convolutions.

The valve of Vieussens, according to Mr. Clarke, consists of four different kinds of layers: 1st, An inferior layer composed of epithelium and continuous with that of the fourth ventricle; 2d, a stratum of longitudinal nerve-fibres, continuous with the white substance of the inferior vermiform process of the cerebellum; 3d, a layer consisting of a multitude of round, granular nuclei of about the 3500th of an inch in diameter, traversed by fibres derived from the subjacent layer; 4th, a superior layer, chiefly granular, but also interspersed with nuclei of the same kind.

Most of the convolutions of the brain consist of eight distinct and concentric layers. The first or superficial layer is a comparatively thin stratum of fine and closely-packed fibres. The second is of a pale or whitish colour, and several times thicker than the first. It is composed of two sets of fibres and a small number of scattered nuclei, which are round, oval, fusi-

[1] Philosophical Transactions, 1859, Part I. p. 442.

[2] There can be no doubt that a considerable proportion of the gelatinous substance and other parts of the posterior cornu are of the nature of pia mater; but amongst this there are numerous small nerve-cells. As I have dwelt, however, on this point in another place (*Phil. Trans.* 1859), I need not repeat my remarks.

form, or angular. The third layer is of a gray colour, from two to four times as thick as the one above it. It is densely crowded with cells of small size, but of different shapes, in company with nuclei like those of the preceding layer. The fourth layer is of a much paler colour. It is crossed, however, at right angles to its plane by narrow, long, and vertical groups of small cells and nuclei of the same general appearance as those of the preceding lamina. These groups are separated from each other by bundles of fibres radiating towards the surface from the central white substance, and, together with them, form a beautiful and fan-like structure. The fifth layer consists of the same kind of vertical and radiating groups of small cells and nuclei; but the groups are broader, more regular, and together with the bundles of fibres between them, present a more distinctly fan-like arrangement. The sixth layer is again paler, and somewhat whitish, but contains some cells and nuclei which have a general resemblance to those of the preceding layers, and are arranged only in a faintly radiating manner. The seventh layer is of a reddish-gray colour of about the same depth as the preceding, and contains the same kind of cells and nuclei, but in much greater numbers, and mixed with some others of rather larger size. The eighth layer is the central white stem or axis of the convolution.

The investigations of Mr. Clarke in the minute structure of the cerebellum confirm, in the main, the observations of Gerlach.

Dr. Thudichum's case of wasting palsy is full of interest not only as a clinical study, but also on account of the remarkable manner in which the symptoms, manifested during the sickness of the patient, were explained by the anatomical lesions discovered after death. J. A. M.

# BIBLIOGRAPHICAL NOTICES.

Art. XVII.—*Transactions of American State Medical Societies:—*

1. *Transactions of the Eleventh Annual Meeting, for the years* 1861, '62, *and* '63, *of the Illinois State Medical Society*, held in Jacksonville, May 5, 1863. 8vo. pp. 80. Chicago, 1863.
2. *Transactions of the Eighteenth Annual Meeting of the Ohio State Medical Society*, held at Ohio White Sulphur Springs, June 16, 17, 18, 1863. 8vo. pp. 94. Cincinnati, 1863.

1. At the session of the *Illinois State Medical Society* for the year 1863, the annual address with which the business of our professional associations are so generally introduced appears to have been dispensed with, the volume of *Transactions* before us commencing at once with reports of committees on professional subjects.

The first of these reports is on "Typhoid Fever," by Dr. H. Noble, of Heyworth. This paper is not without interest, though it sheds but little additional light upon any of the mooted questions relative to the etiology, pathology, prognosis or treatment of typhoid fever—disease which is becoming every day of deeper interest to the physician in consequence of its increasing prevalence, and the fact that it has in nearly all of the malarial regions, of Pennsylvania at least, supplanted in great measure the remittent and intermittent fevers which had been previously considered to be their essential endemics.

The next report is that of a special committee on "Diseases of the Eyes," presented by Dr. E. L. Holmes, of Chicago.

In explanation of the extensive prevalence of conjunctivitis in Illinois and the northwestern portions of the United States generally, Dr. Holmes refers mainly to the dryness of the atmosphere, the brightness of the sun's light, the constant winds, loaded with minute portions of dust, which sweep over the unbroken level of the country, and the reckless manner in which the population exposes itself to these influences. Several of the influences enumerated are unquestionably the same which render conjunctivitis so common a disease in Egypt and Syria. That they are the chief causes of this malady may be inferred from the fact that, in the majority of the cases examined the attack occurred in summer. It is worthy of remark, also, that in Chicago and other places near the lake, where the atmosphere is much moister than in those at a distance from it, conjunctivitis is comparatively rare.

According to Dr. H. a common cause of the spread of catarrhal ophthalmia is contagion, which is rendered the more efficient by the manner in which the small dwellings in the northwestern States are often crowded with people, and by the careless habits of their inmates as regards cleanliness; the disease, when it breaks out in a household, being quickly communicated from one of its members to another by the use in common of the same handkerchiefs and towels.

It is well known that after some penetrating wounds of the eyeball an obstinate chronic inflammation of all the deep-seated tissues is liable to supervene, resulting in the entire disorganization of the organ; and that in these cases the uninjured eye sometimes becomes sympathetically affected. It is a well-established doctrine that the surest way to save the eye when thus sympathetically affected is by the partial or total extirpation of the wounded one. Dr. Holmes goes further, and recommends the extirpation of the injured eye in all cases at once before the other shows any sign of suffering, a practice which, we conceive, would lead to unnecessary mutilation of the patient in not a few instances. The removal of the injured eye, if accomplished early after the other becomes sympathetically affected, is quite effectual in saving the latter.

"Minor Mental Maladies" is the title of the next paper. It is by Dr. ANDREW McFARLAND, and was read before the Association of American Institutions for the Insane. Though deficient in perspicuity, and with a surprising paucity of illustration, considering the fruitfulness of the field, the paper of Dr. McFarland is still replete with interest and instruction. Its value consists, however, mainly in its suggestive character; the author having rather touched than investigated the subjects embraced by his title. It is, we think, not improbable that many of the prominent peculiarities, the eccentricities, the minor vices of character, which distinguish certain individuals from those by whom they are surrounded, will be found, upon more minute investigation, to proceed from partial insanity of mind, and may be styled, not improperly, minor mental maladies. So far, however, as vices of character and disposition are clearly traceable to defective education, mental and moral—to evil example and associations—to the undue development or activity, as the phrenologist would say, of certain of the mental organs at the expense of others, they can scarcely be styled, with strict propriety, mental maladies of even a minor character, nor can they in whom such vices of character and disposition occur be classed with the insane, properly speaking. The entire subject opened by Dr. McFarland in the paper before us is deserving of a more careful and intimate investigation than it has as yet received.

The report of the Committee on "Surgery," by Professor E. ANDREWS, of Chicago, is a highly instructive one, especially that portion of it which treats of *military surgery*. A portion of the committee being engaged in active service during the year embraced in the report, has enabled its author to present a series of conclusions derived from a large number of gunshot wounds in different parts of the body, based upon personal observation or upon information derived from reliable sources.

The entire number of gunshot wounds of which there were full and correct records was 734. Of this number 50 were of the head, namely, flesh wounds and contusions 30, fractures of the face 9, of the cranium 5.

Of the 30 flesh wounds, 16 recovered, 4 died, and 10 remained uncertain. Of the 9 fractures of the face, 5 recovered, 1 died, and 3 remained doubtful. Bullet wounds of the bones of the face are liable to be followed by secondary hemorrhage. Of the 5 fractures of the cranium, 2 were from bullets penetrating the brain, and 3 from pieces of shell or oblique bullets. They all died; one was trephined, but without benefit. The general result of experience is that gunshot fractures of the cranium are fatal, and that trephining is seldom useful. A few unrecorded cases of recovery have come to the knowledge of the committee —these were all wounds of the anterior lobe of the brain, which would seem to sustain injury with less serious results than any other portion of the organ.

*Wounds of the Neck.*—These were ten in number, all flesh wounds: six recovered, and four remained doubtful. Wounds of the large bloodvessels of the neck, and fracture of cervical vertebræ, usually die at once upon the field.

There were 164 *wounds of the trunk:* of these, 36 penetrated the lungs, 10 the cavity of the abdomen; 31 were flesh or fracture wounds of the shoulder, and 87 were flesh wounds of various regions, or fracture of ribs, not penetrating any cavity. Of the 36 wounds of the lungs, 12 recovered, 18 died, and 6 were uncertain. Of the 10 penetrating wounds of the abdomen, 2 were from stabs, 8 from gunshots; the first two recovered. Of the gunshots, 6 died and 2 remained very doubtful. With very few exceptions, bullet wounds penetrating the abdominal cavity were fatal. Of the wounds of the shoulder, 20 recovered an 11 remained in doubt. All the superficial wounds of the trunk terminated favourably.

There were 69 cases of wounds of the arm—namely, 28 compound fractures of the humerus, 41 flesh wounds. All the latter recovered. Of the fractures, 21 recovered, 4 died, and 3 were in doubt. In 6 of the fractured cases, the shoulder-joint was resected; of these, 5 recovered and 1 died. In 6, amputation was performed at the shoulder-joint; of these 4 recovered and 2 died. In 8 cases, amputation of the arm was performed; of these, 7 recovered; the result of the other was unknown. In 8 cases no operation was resorted to, the fracture being treated with splints; of these 7 recovered and 1 died.

There were 14 cases of *wounds of the elbow:* namely, 4 flesh wounds, of which

2 recovered, and the result of 2 was unknown. 10 compound fractures of the joint, of which 7 recovered, 1 died, and 2 remained uncertain. In 4 of these cases, resection of the joint was performed, with 3 recoveries and one death. In 3, amputation of the arm was performed; of these cases 2 recovered, and 1 was undecided. In *three* cases of less severity, no operation was performed; all these recovered.

There were 43 *wounds of the forearm:* 27 flesh wounds, and 16 compound fractures. Of the flesh wounds, 22 recovered, and 5 were doubtful. Of the compound fractures, 10 recovered, and 6 remained doubtful. In 4 of the cases, amputation was performed, all of which recovered.

There were 77 *wounds of the hand:* of these, 38 were flesh wounds, of which 37 recovered, and one died. 25 were attended with fracture of the phalanges, of which 18 recovered, and in 7 the result was unknown. 9 were attended with fracture of the metacarpus, of which 4 recovered, and in 5 the result was unknown. 5 were attended with fracture of the wrist; of these 3 recovered and 2 were doubtful. 24 fingers were amputated, with a favourable result in 19; 5 were not heard from. One amputation was performed through the metacarpals—result unknown. One shot across the metacarpals was very unjustifiably treated by amputation of the forearm, four inches above the injury—the patient recovered.

There were 43 *wounds of the pelvic region:* namely, 40 flesh wounds and 3 attended with fracture. In none of the latter was any of the viscera implicated. Of the flesh wounds, 30 recovered, 3 died, and 7 were undecided. Among the fatal cases was one with injury of the bladder, and another attended with secondary hemorrhage and general exhaustion, from the bad air of an overcrowded boat. 2 of the cases attended with fracture recovered, and 1 died.

There were 109 *wounds of the thigh:* of these, 90 were flesh wounds, and 19 were attended with fracture of the femoris. Of the 90 flesh wounds, 76 recovered, 3 died, and 11 were doubtful. Of the 19 fractures, 6 recovered, 12 died, and 1 was doubtful. In 5 of the fractured cases, amputation was performed at the upper third of the thigh, with 1 recovery and 4 deaths; 3 were amputated at the middle third, with 2 recoveries and 1 death; one was amputated at the lower third and recovered. 2 cases were treated by resection of the fractured portions in the continuity of the joint; both died. 9 cases were treated simply with splints, position, and such incisions as were necessary for the discharge of pus; 3 recovered, 6 died. 2 of the recoveries were in persons who had been shot in the cancellated tissue of the neck or trochanter, and 1 of these had lain twenty hours on the field in very raw and cold weather. The reason why shots through the cancellated tissue, at the superior fifth of the femur, are far less dangerous than those in the compact bone of the shaft, is because, in passing through a soft bony structure, the ball produces only a moderate amount of shattering, whereas the impact of a minie ball upon the brittle ivory of the shaft, splinters it for several inches, and scatters the fragments among all the surrounding tissues, producing very extensive disorganization. Such cases nearly all terminate fatally within the first five days, no matter what is the treatment adopted.

There were 26 *wounds of the knee:* 14 were flesh wounds, and 12 attended with compound fracture. Of the first, 12 recovered, and 2 remained doubtful. Of the fracture cases, 5 recovered, 4 died, and 3 remained doubtful. 1 case was treated by resection of the joint, and recovered; in 1 no operation was performed, and death ensued.

There were 79 *wounds of the leg:* 56 flesh wounds and 23 with fracture. Of the flesh wounds, 51 recovered, 1 died, and 4 were undecided. Of the fractured cases, 14 recovered, 7 died, and 2 were unknown. In 12 amputation of the leg was performed with 11 recoveries and 1 death; 1 was treated by amputation of the lower third of the thigh, and recovered; in one case a portion of bone was resected, which also recovered; 8 were treated by splints alone; of these, 2 recovered, 4 died, and 2 remained doubtful.

There were 50 *wounds of the foot:* namely, 31 flesh wounds, and 4 attended with fracture of the phalanges, which recovered; 6 with fracture of the metatarsus, of which 4 recovered, 1 died, and 1 was unknown; 9 with fracture of the tarsus, of which 7 recovered, 1 died, and 1 remained doubtful. Amputation

of the toes was performed in 4 cases—all recovered. One amputation through the tarsus was performed, and the patient recovered. In 4 cases the leg was amputated, with 3 recoveries and 1 death.

In respect to operations after wounds, we have the following statements:—

*Amputation at the shoulder joint* is only proper where an arm has been torn off, or otherwise so hopelessly disorganized as to render mortification of the limb inevitable. If the head of the humerus only is shattered, resection should be preferred. From the tables given in the report before us, amputations at the shoulder-joint had a mortality of 1 in 3, while resections of the joint showed a loss of only 1 in 6: being an advantage of 6 per cent. in favour of resection, besides the saving of a useful limb. Sabre cuts and bullet wounds, simply opening the shoulder-joint, without serious injury of the bones, require neither amputation nor resection. If, however, the head of the humerus is badly comminuted, an operation is absolutely required, as the mortality of cases treated simply by splints, is found to be over 60 per cent.

*Amputation of the arm* is called for only when there is no hope of the limb being saved. Even in bad fractures of the humerus, or shattered elbow, the operation is not warranted, if there is a good pulse at the wrist. Whenever the circulation continues in some measure below the injury, all loose fragments of bone should be removed, and the limb dressed as for other compound fractures. Of 11 cases of amputation referred to in the report before us, none died.

All cases of *amputation in the forearm and hand*, of which the results could be obtained, recovered. It should be borne in mind, however, that the forearm and hand recover from the most frightful looking wounds with surprising ease, and that every inch which can be preserved is of priceless value to the patient. Of a mangled hand, almost all the remaining portions may, and should generally be retained.

No case of *amputation at the hip-joint* is recorded in the report.

*Amputations of the thigh*, when secondary, are usually fatal, therefore the decision of the surgeon must be made up at once from the appearance of each case, and if amputation be decided on, it should be promptly executed. The records before us show 20 amputations of the thigh, of which 9 died, 10 recovered, and 1 remained doubtful, being a mortality of about 45 per cent. Resection was tried in 2 cases; both died within the fifth day. In 9 cases the treatment was by splints, with merely an incision to evacuate pus; of these, 2 recovered and 6 died.

Amputation should always be performed as far from the trunk as possible.

The following general conclusions in respect to wounds of the thigh are given in the report:—

"1st. A very large portion of the cases with badly comminuted femurs will die within five days, alike under all kinds of treatment. There is no perfect reaction."

"2d. Shots through the spongy tissue of the trochanter and neck of the femur are less fatal than those through the compact tissue of the joint. A large portion of them will recover with simple extension splints, and in some instances incisions to evacuate pus; whereas, amputations and military excisions may be said practically to be all fatal."

"3d. Amputation above the middle of the femur should only be resorted to in desperate circumstances, when the limb below is either torn off or so injured that there is little hope of its escaping mortification. If circulation and innervation are good below, a free incision should be made down to the comminuted bone, and the limb then dressed with a straight splint, and adhesive strap extension bands."

"4th. In all severe compound fractures of the lower half of the femur, and all gunshot fractures of the knee-joint, if amputation can be effected below the middle of the thigh, it should promptly be performed. By this, about 75 per cent. of the patients may be saved, but if attempts are made to save the limb, almost every case will prove fatal."

*Amputation of the leg* may be practised whenever it is impossible to save a useful limb. While, however, the circulation in the foot continues, an attempt

should be made to preserve the limb. The danger of postponing or omitting amputation is not great even though the foot should mortify.

*Resection of the elbow*, in respect to risk to the patient, is about upon a par with amputation; but as the first preserves and the latter takes away the hand, the choice, in every case which admits of it, is clearly in favour of resection.

*Resection of the knee-joint.*—In the report before us it is remarked that more extensive statistics are needed to settle the true value of the operation. The advice given, based upon the observations of the committee and a careful review of the opinions of other surgeons, is that whenever good air and perfect rest can be secured to the patient resection of the knee is to be preferred, but under no other circumstances. Resections of the hand, leg, and foot are to be governed by the same rules in military as in civil practice.

The present volume of *Transactions* closes with a highly interesting and practical paper, by Dr. David Prince, of Jacksonville, on *delayed union of fractures*, which was previously published in the number of this journal for Oct. 1863, p. 313.

2. The *Transactions* of the eighteenth annual session of the *Ohio State Medical Society* opens with the valedictory address of the retiring president, Dr. J. W. Russell. The subject of the address is "the cultivation, advancement, and elevation of the medical profession." The means for effecting these important objects are passed successively in review, and commented upon with great ability.

The first of the scientific papers is one on the "Employment of Electricity in Midwifery," by Dr. D. S. Gans, of Cincinnati.

The cases in which electricity may be employed with advantage within the domain of obstetrics are, according to the investigations of Dr. Gans, and the collation of all the observations in respect to it on record: First, when the production of premature labour is deemed advisable; principally where a kind of preparatory period has been made, by the repeated employment of the warm douche, or by the use of the colpeurysis. Second, in all cases of hemorrhage before and after delivery, and in retarded labour from atony of the uterus. Third, as one of the most powerful and certain means of resuscitating in cases of asphyxia neonatorum. Fourth, as a cautery for various operations on the uterus, as the extirpation of uterine polypus, amputation of the portio-vaginalis, and the exciting to healthy action certain ulcers of the os and neck of the womb.

For a description of the proper mode of applying electricity in such cases we refer to the paper before us.

The next paper is the report of a committee on "New Remedies," by Dr. E. B. Stevens, of Cincinnati.

The remedies noticed in the report are, *opium* and *belladonna* in their property of mutually antagonizing each other when taken into the human system; *inhalations* of *medicated vapours* in certain affections of the respiratory apparatus; the *hypophosphates;* the *compound syrup of phosphates*, or chemical food; *oxygen*, in certain depressed conditions of the system; *preparations of iron*, especially in the treatment of erysipelas; *bromine*, as an antiseptic, and a prophylactic of erysipelas, diphtheria, pyemia, and hospital gangrene, as well as a most important remedy in their control when they have set in, used both locally and constitutionally.

Dr. Stevens makes the following very correct remarks in an early part of his report: "Whenever we arrive at a more correct appreciation of the exact qualities of an *old* remedy; whenever we learn to apply it for the relief of symptoms hitherto overlooked; whenever we discover new combinations of remedies, or a mode of administering them which increases their efficiency as curative agents—in all these cases we have *new remedies* presented to us quite as truly, for all practical purposes, as though we had absolutely discovered a new drug."

The next report is that on the "Number and Condition of the Medical Societies of Ohio," by Dr. R. Wallace, of Lewisburg.

The report presents no very flattering exposition of the condition of these associations, which are so necessary for the promotion of medical knowledge, medical union, medical ethics, and for the defence of medical practitioners in the maintenance of their just rights. As is the case nearer home, there are in Ohio

many physicians who, either from a perfect indifference to everything beyond what they esteem their own individual interests, or some other equally selfish pretext, keep themselves aloof from all professional organizations; in consequence the medical society has generally neither the support nor countenance of the medical men of the several counties of the State. This condition of things should not be. The power of associated influence and co-operative action in the attainment and spread of useful knowledge and in the bringing of such knowledge into practical usefulness, is beginning to attract public attention everywhere, and we may hope that the time is near at hand when the entire body of the medical men of the United States will feel themselves in duty bound to aid effectually in perfecting and sustaining the professional organizations of our several counties and States, and of the untire Union.

The next paper is an account of the arrest and cure of a case of "Mollities Ossium" by the use of phosphate of lime and phosphoric acid. Reported by Dr. N. DALTON, of Logan.

The patient was a female 17 years of age, who had been confined to her bed for upwards of eight months, with pains in her bones and deformity of the osseous tissues of the whole of the right side, with entire absence of osseous matter in the left lower extremity and great deficiency of it in that of the left side. There was irritability of stomach—rejecting nearly all other than acid food; while all acids, the patient complained, caused her exceeding languor. The ejections from the stomach were decidedly acidulous; in the urine there was a large quantity of a grayish deposit, equal to one-third the volume of the urine passed, especially in the morning. By analysis the urine was found to be full five and a half grains to every ounce. The patient was placed under the use of the phosphate of lime, which was carried to the extent of twenty grains for a dose at each of her meals; and at the same time from a half grain to a grain of phosphoric acid between breakfast and dinner, and between dinner and supper.

After this treatment had been persisted in for about six months, the patient was able to walk about her room. The deformity of the bones was relieved in only a slight degree. The patient acquired finally the ability to move about and endure considerable bodily labour. The reasoning of Dr. Dalton in support of the adaptedness of the treatment described, in cases of mollities ossium, scrofula, chronic ulceration in strumous subjects, rickets, etc., is well deserving of an attentive perusal.

The paper next in order is entitled "Remarks on certain Adipose Tumours." It is by Dr. ALEX. MCBRIDE, of Berea. The doctor, as medical examiner of recruits, met in some seven or eight instances with a tumour, situated on the linea alba, about equidistant between the umbilicus and xyphoid cartilage, of a globular shape, soft, doughy, and about the size of a nutmeg or small walnut. They were at first mistaken for ventral omental hernia. They were irreducible, and in all cases caused the patient unpleasant sensations. In the hospital at Camp Chase in the month of March, 1863, a soldier was affected with one of these tumours. He was attacked with disease, of which he died. By a post-mortem examination it was ascertained that he had died of peritonitis with effusion of serum and plastic lymph. Beneath the adipose tissue of the anterior abdominal parietes, there existed a smooth globular tumour, about the size of a nutmeg, enveloped in delicate cellular membrane, and easily separable from the adipose tissue. It was attached by a pedicle, about two lines in diameter, which was found to pass through a circular orifice in the median line of the linea alba, and then to lose itself among the adipose substances between the linea alba and peritoneum. It did not pass through the peritoneum, nor had it any connection with it. Upon laying open the tumour it was found to be composed of the same adipose tissue with which it was in connection, though a trifle less fatty in appearance. Here, then, Dr. McBride remarks, was a protrusion of supra-peritoneal adipose tissue through the linea alba, carrying with it a sac of cellular tissue. There is no reason to suppose the tumour had any connection with the disease of which the patient died. From the examination in this case Dr. McBride infers that all the tumours he saw before and afterwards, occupying the same locality and presenting similar appearances, were, in fact,

adipose hernial tumours of the linea alba. By others similar tumours, similarly located, had been observed. It is supposed that in every thousand invalided soldiers one case of this form of tumour will be found. Surgeon W. L. Peck found three of them, while examining over one thousand recruits. Dr. Hamilton reports three cases in fourteen hundred. D. F. C.

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ART. XVIII.—*Reports of American Hospitals for the Insane:—*

1. *Of the New York State Lunatic Asylum, for the years* 1861 *and* 1862.
2. *Of the Central Ohio Lunatic Asylum, for the fiscal year* 1861–62.
3. *Of the Southern Ohio Lunatic Asylum, for the fiscal year* 1861–62.
4. *Of the Vermont Asylum for the Insane, for the fiscal year* 1862–63.
5. *Of the Maine Insane Hospital, for the year* 1863.
6. *Of the State Hospital at Worcester, Mass., for the fiscal year* 1861–62.
7. *Of the State Hospital at Northampton, Mass., for the fiscal year* 1861–62.
8. *Of the Maine Hospital, for the year* 1862.

1. IN 1861, as appears by its report for that year, the New York *State Lunatic Asylum*, at Utica, was relieved of a burthen which had long been borne, and which still weighs oppressively upon many of the other State hospitals for the insane. All the male convicts who had been committed to its care were transferred to the hospital at Auburn, which was expressly intended for that class of the insane.

In this movement "the State," remarks Dr. Gray, "has inaugurated a progressive step," and we cordially unite with the doctor in the hope that "the precedent now established will become a settled policy, and finally embrace the exclusion of all classes of 'criminal insane' from the ordinary asylums, and secure their treatment in separate institutions, or in wards adjoining and connected with the hospital department of the prisons, and under the care of the prison or other competent physicians."

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital November 30, 1860 . . | 282 | 235 | 517 |
| Admitted in course of the year . . . | 154 | 141 | 295 |
| Whole number . . . . . | 436 | 376 | 812 |
| Discharged, including deaths . . . . | 157 | 123 | 280 |
| Remaining November 30, 1861 . . . | 279 | 253 | 532 |
| Of those discharged, there were cured . . | 48 | 35 | 83 |
| Died . . . . . | 21 | 10 | 31 |

Died of general paralysis, 10; exhaustion from insanity, 8; tubercular consumption, 4; erysipelas, 3; syncope, 2; paralysis, pneumonia, epilepsy, and meningitis, 1 each.

In the ten cases of mortality from the paralysis peculiar to the insane, the ages of the patients "varied from 28 to 57 years; and the duration of the disease from ten months to three and a half years. The disease was ushered in by convulsions in two cases. In nine it was associated with dementia, and in one with mania. Four were persons of correct and six of intemperate habits."

Of the admissions, "forty-six were strongly marked suicidal cases, most of whom had attempted self-destruction before admission; fourteen others were homicidal, and four suicidal and homicidal.

"One man and two women received were, after observation, found not to be insane, but cases of confirmed inebriety.

"Two of these cases were sent by the public authorities, and one by friends, and all under medical certificates of insanity."

In relation to the reluctance to sending insane persons to the hospitals, the report says:—

"In some places and among some people this reluctance arises from a false impression of the character and operations of such institutions, originating in

stories of uncured patients, discharged employees, or general gossip. Others augur unfavourably in regard to asylums from the means resorted to by themselves at home to restrain and care for their friends.

"Thus those who bring patients in chains and ropes, and who have used harsh measures, are very apt to enjoin kind care and be suspicious of the institution. In the main, however, it is because people naturally shrink from the idea of such separation of those who are dear to them, from home and its associations and comforts, especially in the time of affliction. They feel that in doing so they are consigning them to the hands of strangers, and knowing little of insanity they comprehend neither the danger of delay nor the value of timely treatment. They have been accustomed to think of an asylum as the last dreaded resort, instead of the safest and surest curative means to be adopted, and in the hour of sorrow are ill prepared to seek evidence or modify their opinions on the subject."

The following articles were contributed to the soldiers of our army, the officers and employees furnishing the money necessary for the purchase, and the patients making such as were not already made: Dressing-gowns, 20; rolls of bandage, 40; towels, 500; silk handkerchiefs, 8; shirts, 2; pin-cushions, 142; pairs of socks, 42; currant jelly, 3 gallons; raspberry vinegar, 84 bottles; revolvers, 3; military belts, 4; knit woollen shirts, 96; woollen stockings, 96 pairs; blankets, 1 pair.

We proceed to the report for 1862:—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital November 30, 1861 . . | 279 | 253 | 532 |
| Admitted in course of the year . . . | 165 | 122 | 287 |
| Whole number . . . . . | 444 | 375 | 819 |
| Discharged, including deaths . . . . | 182 | 123 | 305 |
| Remaining November 30, 1862 . . . | 262 | 252 | 514 |
| Of those discharged, there were cured . . | 53 | 53 | 106 |
| Died . . . . . | 16 | 14 | 30 |

Died of phthisis pulmonalis, 8; general paralysis, 4; exhaustion from mental disease, 5; epilepsy, 3; paralysis, 2; pneumonia, cerebro-spinal meningitis, apoplexy, suicide, meningitis, gastritis with peritonitis, 1 each; unascertained, 2. In the two cases last mentioned the symptoms were obscure, and there was no post-mortem examination.

"Thirty-three of the whole number admitted had previously been inmates of the asylum. Of these, twenty-nine were received for the second, three for the third, and one for the sixth time. Nineteen of the thirty-three had, at various periods, been discharged recovered, and fourteen improved or unimproved. These latter were again placed under treatment on account of their becoming unmanageable at home, or dangerous to the public.

"Forty-five of those admitted (twenty-one males and twenty-four females) were suicidal, eighteen of whom had attempted self-destruction by various means. Twenty were homicidal, ten men and ten women, four of whom attempted and one committed homicide.

"A number were brought to the asylum in irons, some badly bruised; one with fracture of the clavicle, one with fracture of the ribs and sternum, and one with fracture of the arm. One woman gave birth to a child, at full period, a few days after her admission, although the officer bringing her to the asylum was disposed to consider her declaration as to her condition one of her delusions. The child was well developed and healthy, and, after a time, was sent home, and the mother soon recovered from the acute attack of insanity.

"The injuries above mentioned were not chargeable to intentional violence, but to the ignorance and want of experience of those having charge of the insane persons before their admission to the asylum. Those injured were all cases of acute maniacal disease, and the patients made no complaint of pain or injuries, and the facts were not suspected until revealed by our examination."

Of the 287 patients admitted, the origin of the disease was attributed to the war in but one alone.

Dr. Gray endeavours to account for the apparent exemption of our people

from that increase of mental disorders which, both from history and philosophy, we had been taught to believe must be one of the inevitable consequences of a state of warfare such as that in which we are placed. We have already, in a notice of another report, which, in the arrangement of this article, is placed on a subsequent page, made all the extracts upon this subject for which we have room.

| | |
|---|---|
| Patients admitted from January 16, 1843, to December 1, 1862 . | 6629 |
| Discharged, cured . . . . . | 2634 |
| Died . . . . . | 774 |
| Not insane . . . . . | 52 |

These two reports are less elaborate and consequently contain less matter of professional interest than most of those which had previously come from the pen of Dr. Gray.

2. The general statistics of the *Central Ohio Lunatic Asylum*, for the year ending November 1, 1862, are as follows:—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital November 1, 1861 . . | 132 | 120 | 252 |
| Admitted in course of the year . . . | 77 | 80 | 157 |
| Whole number . . . . . | 209 | 200 | 409 |
| Discharged, including deaths . . . . | 69 | 80 | 149 |
| Remaining November 1, 1862 . . . | 140 | 120 | 260 |
| Of those discharged, there were cured . . | 44 | 46 | 90 |
| Died . . . . . | 4 | 9 | 13 |

Died of general paralysis, 3; consumption, 3; apoplexy, pneumonia, inanition, fever, variola, suicide, and typhomania, 1 each.

The poison of variola was introduced into the hospital through some unknown channel, though it was supposed to have been by some visitor from an infected camp, and fifteen patients took the disease. In only one case did it prove fatal.

Nine insane soldiers were among the patients admitted. In regard to this class of patients Dr. Wills makes the following remarks:—

"The patients derived thus far directly and indirectly from the military ranks are in most instances those who have had previous attacks. This being the case in so great a proportion of instances, I would consider it a good rule to exempt and reject from military duty in time of war, all persons who have been recently insane. Independent of the excitements found in military life, the irregular mode of living, frequent loss of sleep, occasional deprivation of food, excessive fatigues, and exposures to wet and cold, are almost sure to induce insanity in those that are predisposed, and to cause relapses in those recently recovered."

We make the subjoined extract relative to medical treatment, with the preliminary remark that, in many cases of recent mania, we would not administer opiates until the secretions into the alimentary canal have been stimulated by appropriate medication:—

"If sleep be absent (and what case of mania ever occurred without its being deficient?), an adequate dose of a well chosen soporific is more likely to procure it than any other means. If high nervous excitement exists, stimulants and anodynes may gradually allay it when all other means would fail. If secretions are deficient or perverted, correctives should be used. If digestion be poor, stomachics, tonics, and appetizers are wanted. There are very few cases brought to an asylum that do not, in their early stages, need some medication, and we greatly fear that in many cases they are permitted to pass into a chronic and incurable condition for the want of it."

The extent to which patients are employed in the hospital at Columbus, may be inferred from the following paragraph:—

"For several years we have manufactured all the boots, shoes, and slippers required to be furnished by the State, and have done all the repairing in that line. We have made all the clothing required to be furnished for both males

and females, and have done all the repairing required for either sex. In the carpenter, joiner, and cabinet departments, besides extensive repairs and improvements all about the premises, many articles of furniture have been made, and a large number repaired."

Dr. Wills returned from a visit to some of the European hospitals but a short time before the date of this report. In respect to the results of his journey, he says:—

"Although we found many things suggestive, and made many observations, we trust, to our profit in the specialty, yet we returned well satisfied with the general character of our American asylums. There are very few features in which they are behind in the scale of excellence, and certainly many in which they excel."

In regard to the use of mechanical restraints he remarks: "It *is said* that in England they are entirely abolished, but though this is not true, it is very nearly so," and in this connection asserts that in the hospital at Columbus, "during the last three years, we have not had any muff, camisole, or similar device in use, more than, on an average, in one case for one-fourth to one-half of the time. This would be *one-fifth to one-tenth of one per cent.* only." He acknowledges that, in Great Britain especially, the patients are employed in manual labour "to a surprising degree in some of the asylums;" and closes his remarks as follows:—

"On the whole, though we found in several countries many incentives to improvement in the management of the insane, yet we witnessed, in the course of our tour, more listless, lolling inactivity, and more physical restraints, as confinement of hands and limbs, strapping to chairs, benches, bedsteads, and walls, not omitting certain clanking sounds, than we expect or believe possible to witness again without recrossing the Atlantic. Even at Gheel, in Belgium, where, theoretically, there is the largest amount of personal liberty, I found a high degree of what I term physical restraint."

3. In April, 1862, Richard Gundry, M.D., was elected to the office of Superintendent of the *Southern Ohio Lunatic Asylum*. Dr. Gundry had acted during the next preceding five years as assistant physician in the same hospital.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital, Nov. 1st, 1861 . . | 78 | 81 | 159 |
| Admitted in course of the year . . . | 44 | 48 | 92 |
| Whole number . . . . . | 122 | 129 | 251 |
| Discharged, including deaths . . . . | 46 | 44 | 90 |
| Remaining, Nov. 1st, 1862 . . . . | 76 | 85 | 161 |
| Of those discharged, there were cured . . | 28 | 33 | 61 |
| Died . . . . . | 8 | 3 | 11 |

Died of apoplexy, 2; mania, 2; consumption, 2; paralysis, epilepsy, dysentery, pneumonia, and phlegmonous erysipelas, 1 each.

In no report have we seen the apparent influence of our civil war, as a cause of insanity, more accurately or more briefly stated than in the one now under notice. After mentioning some of the most unfavourable consequences of the struggle, Dr. G. says:—

"Yet with these and other unquestioned evils following in the train of this gigantic war, added to the ordinary sources of mental disquietude, it is satisfactory to note, that the tendency to insanity has not been materially increased. That the events of the war have given colour and direction to the delusions of many already unsound in mind, or on the point of becoming so—that to the war-excitement must be charged the insanity of some so predisposed to disease that any pressure upon them in ordinary times would have precipitated an attack, may be readily admitted, so the grief at the loss of friends who have died in the hospital or on the field, has undoubtedly occasioned some attacks; yet it will hold good, as a general statement, that the proportion of those becoming insane, to the general community, has not been materially affected during the past year. If, therefore, some accessions to the numbers of the insane can be traced to causes arising out of the war, it must also be true that some other *causes* have been rendered inoperative in equal proportion. The evils alluded

to cannot have been altogether without some compensating good, which should not pass unnoticed. At no period has personal benevolence been so general and so heartfelt. At no time have all selfish cares and anxieties given place to thoughtfulness for the good of others. To save for our suffering soldiers has induced greater habits of care and providence; to aid the sick and wounded has occupied many hours of generous labour, and all minor personal evils have meanwhile been disregarded. The interest thus manifested in relieving the wants of those brave men who have gone to do battle for their country, has (as it were) lifted up many beyond the influence of the ordinary causes of mental affliction. So far, therefore, as the existence of the war has taught those at home to think less anxiously about their own immediate cares and trials and interests, and to feel more earnestly for others—so far as it has given rise to a genuine disinterestedness and benevolence (whatever enormous evils have resulted in other ways)—so far it has tended to lessen rather than increase the liability to mental disease."

We cannot leave this subject without the remark that there are reasons to believe that the conclusion that insanity has not increased since the commencement of the war—an opinion generally prevalent among physicians and laymen—has been reached without sufficient knowledge of the conditions and facts bearing upon the question. Hence, in introducing the foregoing extract, we have prefixed to the clause "influence of our civil war," the qualifying word "apparent."

It is doubtless true that pecuniary inability resulting from the war has kept many insane persons at home who would otherwise have been sent to the hospitals. It is not unlikely that the numbers sent to almshouses, or other county and town receptacles, have increased rather than diminished. Again, the very important fact is probably not generally known that the number of insane persons admitted into the Government Hospital for the Insane, near Washington, an institution which has been in operation since January, 1855, has more than quadrupled since the war began.

In the fiscal year ending June 30th, 1860, the number admitted was 92, while in that which ended with the 30th of June, 1863, the number was 357; and in the seven months included between the date last mentioned and the 1st of February, 1864, it was 269—an average monthly rate of 38, or more than five times the average rate of 1860.

It is said that the president of the Sanitary Commission has publicly asserted that there has been no insanity in the army, since the beginning of the war. This assertion, of course, was the offspring of misinformation. The extent of its truth may be inferred from the facts exhibited in the following table of admissions of persons from the two branches of the national service into the Government Hospital for the Insane:—

| | From Army. | From Navy. | Total. |
|---|---|---|---|
| Admitted in course of year ending June 30, 1860 | 26 | 8 | 34 |
| Admitted in course of year ending June 30, 1861 | 24 | 6 | 30 |
| Admitted in course of year ending June 30, 1862 | 139 | 15 | 154 |
| Admitted in course of year ending June 30, 1863 | 297 | 12 | 309 |
| Admitted in 7 months, from July 1st, 1863 to February 1st, 1864 . . . . . | 227 | 14 | 241 |

Thus it appears that, in less than three years after the commencement of the war, the annual admissions from the army had increased more than eleven hundred per cent.; and, up to the present time, taking the seven months above mentioned as the criterion for the year, the increase has been about fifteen hundred per cent.

The first call for volunteer troops was *in April*, 1861; the first admission of an insane soldier of the volunteers was on *the 5th of May*, 1861. In June of the same year there were none, but in July there were *three;* in August, *four;* in September, *six;* in October, *six;* in November, *five;* and in December, *eight*. As early as February, 1861, the monthly number of insane received from the volunteer troops were *fourteen*, or half as many as the number of days. In the

seven months next preceding the 1st of February, the average monthly number was $30\frac{4}{7}$; *i. e.*, $21\frac{4}{7}$ volunteers were admitted in 215 days.

But even these statistics do not show the full extent to which mental disorders prevail in the Federal army. A considerable number of insane soldiers have been received into other hospitals than the one above mentioned, and there is good reason for the belief that many have never been taken to any curative institution.

In the discussion of the alleged causes of insanity, we meet with the following paragraph which contains some apparently original views:—

"From this, as from all other statistical records upon the subject, however imperfect, we glean one fact: that in a large proportion of cases, the health had been impaired shortly before or at the time when insanity was first observed."

The subject of hereditary transmission of mental disorders is ably handled, but we have room for the author's conclusions alone:—

"1. Insanity is transmitted with general identity in form of disease, general course of phenomena and age of accession.

"2. The inherited disease may be so intensified in succeeding generations that its access is earlier, its symptoms are more grave and the tendency to recover lessened. Or if recovery takes place, a recurrence of the attack is more imminent.

"3. Insanity may be the result in one generation of any one disease of a nervous type in a former generation. But this transformation does not extend to diseases of another type.

"4. The peculiarities of a highly nervous temperament may in a succeeding generation be so exaggerated as to become symptoms of mental disease. So also may uncontrolled propensities and instincts engender like disease in the posterity."

The extract given below describes, according to our view of the subject, the *true* method of action in all cases of insanity. We have always believed, what we now very well know, that there are many insane persons who can be as well treated at their homes as in the hospitals: and one of the principal reasons that have induced us to urge the importance of a more general study of the disease, is, that physicians in general practice may acquire a more discriminative power in regard to the question of home treatment or hospital treatment.

"After a careful discrimination between those cases which can be judiciously treated in their own homes, and those which require removal from all old associations, from the familiar faces of friends and the endearments of home, all perverted by their diseased judgment, into sources of irritation, and having arrived at the conclusion that hospital treatment is requisite, it must then be borne in mind that 'to be well done it must be done quickly.' What is true of all diseases, to some extent, is especially true of unsound mental manifestations, that the earlier they are detected and brought under appropriate treatment, the chances of a successful issue are incalculably increased. On the other hand, delay adds, in ever-increasing ratio, to the prolongation of the disease, and the probability that it shall never disappear."

We have no personal acquaintance with Dr. Gundry, but judging from this, his first report, we are disposed to congratulate the inmates of the Dayton Hospital, as well as the people of Ohio, upon his accession to his present office.

4. We have to add another conflagration to the somewhat copious chapter of accidents of that kind already furnished by the brief history of hospitals for the insane in America.

On the 21st of December, 1862, the *Vermont Asylum* was discovered to be on fire "in the room directly over the furnace, in the male wing, immediately adjoining the centre building." The wind being high, the fire extended rapidly, and notwithstanding the exertions of the fire companies, was not subdued until it had destroyed the main or central building, and the whole of the wing occupied by men. The patients were all safely removed, but the furniture was mostly consumed.

Measures for reconstruction were immediately taken, and at the date of the

report before us, it was thought that the new edifice would be completed in the course of the year 1863.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital, August 1, 1862 . . . | 232 | 231 | 463 |
| Admitted in course of the year . . . . | 47 | 51 | 98 |
| Whole number . . . . . | 279 | 282 | 561 |
| Discharged, including deaths, . . . . | 71 | 48 | 119 |
| Remaining, August 1, 1863, . . . . | 208 | 234 | 442 |
| Of those discharged, there were cured . . | | | 41 |
| Died . . . . . | | | 38 |

"In noticing the causes of insanity," remarks Dr. Rockwell, "we have failed to see as many cases produced by the progress and results of the war as might be anticipated. The fears, the anxieties and suspense of those who have had some dear relative in their country's service; the affliction and grief of those whose affectionate objects have died on the battle-field, or in the hospital, not to mention the fears of those who suffered intensely lest they should be drafted to sustain and defend their country and its liberties, all have had their influence, if not in producing, at least in giving a form to the insanity of the time. On the other hand, the general, if not the universal, desire to lessen the hardships of the soldier's life, and to promote his comfort and welfare, while in his country's service, has called forth that generous labour, and awakened that disinterested benevolence, and diverted the mind from personal trials and afflictions, the tendency of which is favourable to the preservation of mental soundness."

5. "It is a fact somewhat significant," writes Dr. Harlow, in his report, for 1863, of the *Maine Insane Hospital*, "that the number of patients admitted the past two years has been less than that of any corresponding period within the last ten years, which may be owing, in part, to the new and unusual occupation which has so thoroughly possessed the American mind since 1861. The awakening, by the great rebellion, of that wholesome principle in man—love of country which was slumbering in the heart, has seemed to check, for a time, the onward flow of insanity."

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital December 1, 1862 . . | 129 | 129 | 258 |
| Admitted in course of the year . . . | 66 | 52 | 118 |
| Whole number . . . . . | 195 | 181 | 376 |
| Discharged, including deaths . . . . | 67 | 44 | 111 |
| Remaining, December 1, 1863 . . . . | 128 | 137 | 265 |
| Discharged cured . . . . . | 24 | 28 | 52 |
| Died . . . . . | 18 | 6 | 24 |

Died with consumption, 6; general paralysis, 3; exhaustive mania, 2; senile gangrene, 2; congestion of brain, disease of heart, enteritis, inflammatory sore throat, erysipelas, pleurisy, and old age with chronic insanity, 1 each.

Ill health is mentioned as the most prolific of the causes of mental disorder among the patients received in the course of the year. "Our own observation," remarks Dr. Harlow, "has long since convinced us that if some means could be devised by which the tone of physical health could be elevated, the wards of our lunatic asylums (query—hospitals for the insane?) would soon become comparatively vacant, and our labour in this specialty lightened in no small degree. It must be apparent to all, that any one of the many moral causes of insanity falling upon a constitution deprived by physical degeneration or otherwise of one-half or three-fourths of its vital power, must act with proportionate force, and eventually result in the overthrow of the person attacked."

6. Dr. Bemis, near the beginning of his report of the *State Lunatic Hospital*, at Worcester, Mass., for the year terminating with the close of September, 1862, says:—

"Nothing occurred to mar the general good order and comfort of the house until late in the year, when a large number of our male attendants enlisted in the service of their country, making it necessary to employ an equally large

number of men, and strange hands in their places. This has been the cause of considerable uneasiness and excitement in the male wards, and it will probably require several months of hard labour to bring back the usual comfortable state of things."

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital October 1, 1861 . . | 184 | 195 | 379 |
| Admitted in course of the year . . . | 108 | 113 | 221 |
| Whole number . . . . . | 292 | 308 | 600 |
| Discharged, including deaths . . . . | 92 | 112 | 204 |
| Remaining September 30, 1862 . . . | 200 | 196 | 396 |
| Of those discharged there were cured . . | 58 | 66 | 124 |
| Died . . . . . | 11 | 23 | 34 |

Died of consumption, 10; typho-mania, 5; palsy, 6; old age, 5; marasmus, 3; epilepsy, 2; exhaustion, 2; suicide, 1; congestion of the brain, 1.

Each of the five patients who died of old age was over 70 years of age, and three of them over 80. They were all men, and one of them had been in the hospital nearly thirty years.

It appears that an earnest attempt has been made at this hospital to develop the industrial capacities of the patients; and in this report we find, for the first time in any American document of its kind, a detailed record of the amount of work, as measured by time, performed by the patients in the course of the year.

Believing this to be a progressive step, we give Dr. Bemis the benefit of an exposition of his views by quoting his remarks in full:—

"During the past year much attention has been paid to the subject of labour. Strict and methodical accounts have been kept of the number of patients employed, and the time of service. More than twenty-one thousand days' work have been performed, a great variety and amount of labour having been accomplished. Strictly as our account has been kept, however, we shall be misled if we rely too much upon it. We must remember that for every four or five patients engaged in ordinary labour, a competent person must be paid whose time is necessarily spent in directing and assisting the insane at their work, and who often accomplishes with his four or five patients less labour, and of an inferior quality, than he would have performed alone. Then there is the loss of time and expense attending the more frequent elopements. Then, too, there is the great liability to accident from the use of tools among the insane, and the increased danger from fire, when so large a number of patients are permitted the privileges necessary to induce them to labour.

"Besides these considerations, the introduction of labour as a system requires other outlays.

"We are thoroughly satisfied, however, that occupation of some kind has a curative influence of the highest importance, and in order to realize the full benefit of it we have taken unwearied pains in this direction.

"At all times the character of the labour has been regulated with due regard to the patient's feelings, and so far as possible, in accordance with his previous occupation, and as great a variety of labour has been provided as our limited means would justify."

Other branches of the moral treatment are mentioned in the subjoined extract:—

"It gives us pleasure to be able to report a good degree of success in our efforts to amuse, instruct, and gratify in our patients a wholesome love of variety, and to introduce to them many new subjects of thought, lectures, readings, social entertainments of various kinds, by books, pictures, and maps, and by every means which our limited income would allow. Our lecture season continued with some interruptions through the entire year. Concerts of sacred music have also frequently been given by friends from the city. Sociables are often held during the long winter evenings, at which both sexes join in all the games common on such occasions. In all our labours every effort has been made to keep alive the mental faculties of the patients by introducing to them such subjects of thought as require only simple and easy mental action, hoping thereby, if possible, to assist in arresting the progress of disease, and to prevent

the remaining faculties from being involved in that general ruin which is sure to overtake the minds of those who cannot be interested in anything beyond the sphere of their own personality."

7. Some of the most important results of the record of the medical history of the *State Lunatic Hospital* at Northampton, Massachusetts, for the official year ending with the close of September, 1862, are as follows:—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients at the beginning of the year . . | 149 | 183 | 332 |
| Admitted in the course of the year . . | 64 | 48 | 112 |
| Whole number . . . . . | 213 | 231 | 444 |
| Discharged, including deaths . . . . | 66 | 46 | 112 |
| Remaining at the end of the year . . . | 147 | 185 | 332 |
| Died . . . . . | 9 | 9 | 18 |

Died of marasmus, 5; phthisis, 5; epilepsy, 2; general paralysis, 2; suicide, 2; apoplexy, 1; maniacal exhaustion, 1.

Although we are informed by the report that the hospital, during the year referred to, has enjoyed an "exemption from sickness and a degree of success which call for the deepest gratitude," yet nothing is said in regard to cures. If any patient was restored to his normal mental condition, the fact has been overlooked or disregarded in the preparation of the report.

The omission is to be regretted; and it is to be hoped that this method of reporting will not be continued. We hold that the superintendent of every hospital for the insane is in honour bound to give to the profession such scientific knowledge as his position enables him to accumulate, a species of knowledge which cannot be acquired in any other place. If, therefore, the authorities to whom a superintendent may directly address his report, can excuse him for the neglect to exhibit the result of the year's labour in regard to one of the primary objects of the hospital, the members of the profession will at least be disposed to think that such an exhibition ought to have been made.

It is well known that a very large proportion of the cases at Northampton are chronic, and consequently incurable. All just allowance should be, and is, made for this unfavourable condition of things at that hospital. It is not expected that the cures will be numerous; and, for ourselves, we should have read the report with much greater satisfaction if we had met with the clause "cured, none," than we have as it now stands, devoid of any allusion to cures or curability.

In his remarks upon "premature removals," of which it is stated that the number has been unusually large, Dr. Prince says:—

"Not only is permanent and vital injury often done to patients themselves by premature removal from the salutary restraints of a hospital, but there are other consequences not less unpleasant, involving great injustice toward the institution in which they have been placed, at a time when disease had not removed all possibility of feeling. Few patients go away from home, among strangers, to a hospital voluntarily. There is always more or less coercion. When one leaves the hospital before he is cured, he rarely fails to connect all the disagreeable circumstances of his illness, as far as memory, and often as far as his imagination serves him, with those who have *last* exercised control over him. This impression seldom wears entirely away, although recovery may take place. In some cases it does, but, in many, the recollection of pure fancies as realities is never corrected."

A considerable part of the report before us is occupied by a discussion of the question of adequate employment for the chronic insane. Dr. Prince thinks that some of this class might be employed with a special view to the *profits* of labour. But he says, "In the hospital let us have labour hygienic but not necessarily profitable. Let it cure, if it may; but in the name of humanity do not oblige it to be profitable. Let it soothe and heal and amuse if it can, but let us look elsewhere for its profits. Few superintendents can spare from other pressing and higher duties the time and attention necessary to give any hope of success in industrial occupations in their hospitals." Hence he would have

separate institutions for the labouring chronic insane; and, having specially in view the inmates of the State institutions of Massachusetts, he writes as follows:

"Perhaps a judicious system of *colonization*, as practised in some European countries, may be found equally beneficial to the patient and the treasury of the commonwealth. That these patients are not entirely unproductive, as a class, the industrial statistics of some institutions clearly show. The amount of labour performed in some of these, if the figures are reliable, is quite remarkable, and strongly suggestive of the idea that, by proper selection of cases, proper care and superintendence, in suitable localities, *under a suitable system of general supervision*, much might be done to develop a latent element of profit by fanning into life the now dormant and fading spark of usefulness in these truly pitiable sons and daughters of misfortune. A few trials, entirely experimental, made during the year now closed, lead to the belief that much good, with little risk, would result from a carefully conducted series of experiments in this direction under suitable skilful supervision."

We often present to our readers, without comment, views and opinions touching the management of the insane which are diametrically opposed to our own; but, in the present case, as the subject is of great importance, we do not feel justified in silently passing it by. Our space, however, does not admit of a free discussion of it, and we shall therefore confine ourselves almost exclusively to the expression of an opinion.

It is many years since we arrived at the conclusion that the best of all known plans of treating the insane is that upon which the American hospitals are based. The opinion then formed has neither been changed nor in any way modified by intervening events or further observation and study. If there be, as there unquestionably is, a class of chronic insane who can be employed with benefit to themselves and pecuniary profit to any one, let that class form a part of the inmates of each hospital, and let them there be systematically employed. If the superintendent has not time to conduct this industrial department, let a special officer be entrusted with its management. We think that the most striking examples of the profitable employment of the insane in foreign countries will be found in hospitals identical, or essentially similar, in plan to those of the United States.

It appears that the hospital at Northampton is liberally supplied with means for the recreation, entertainment, and amusement of its patients.

The patients are assembled at a religious exercise on each evening of the week not otherwise occupied.

8. The following statistics are from the report for 1862 of the *Maine Insane Hospital*:—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital November 30, 1861 . . | 133 | 119 | 252 |
| Admitted in course of the year . . . | 69 | 56 | 125 |
| Whole number . . . . . | 202 | 175 | 377 |
| Discharged, including deaths . . . . | 74 | 45 | 119 |
| Remaining November 30, 1862 . . . | 128 | 130 | 258 |
| Of those discharged, there were cured . . | 34 | 23 | 57 |
| Died . . . . . | 15 | 4 | 19 |

Died of exhaustive mania, 3; apoplexy, 3; consumption, 4; general paralysis, congestion of lungs, typhoid fever, epilepsy, dysentery, chronic diarrhœa, serous epilepsy, delirium tremens, and old age and chronic insanity, 1 each. The insanity of one of the patients is attributed to "military excitement."

The average number of patients for the year was 254. "Every dormitory was occupied," and some harmless, incurable cases were discharged to make room for others. Under these circumstances, Dr. Harlow urges the necessity of further provision for the insane in the State.

Heating by steam, and artificial ventilation by a fan, have been adopted at this hospital; and it is asserted in the report that "it is decidedly the most valuable improvement that has ever been introduced."

No apology need be made for the insertion, even in this place, of the following

brief notice of the Hon. Reuel Williams, a member of the Board of Trustees, who died in the course of the year covered by the report:—

"With a father's care he watched over the interests of the hospital from its beginning, spending days of his valuable time in devising means to promote the comfort and well-being of those who had fallen victims to this worst of human ills, and had come hither for relief. For more than fifteen years he was an active member of the Board of Trustees, performing much of the heavy work which devolved upon the Board, without ever receiving a dollar of compensation for his labour; and when advancing years admonished him that it was time to lay aside the cares of public business, and he resigned the office of Trustee, yet his interest in the institution did not abate. Often his thoughts adverted to it, and his steps were directed hither, where his counsel and advice were freely given to facilitate the best good of the Asylum."

Dr. Harlow occupies several pages in the discussion of the subject: "A popular indifference to, and disregard of, the laws of physical health, a prolific source of the increasing insanity in the community." In notices of other reports, we have heretofore so fully represented the views contained in this discussion that, in consideration of our limited space, we must be excused from making any extracts.

P. E.

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Art. XIX.—*Medico-Chirurgical Transactions.* Published by the Medical and Chirurgical Society of London. (Second Series, Volume the twenty-eighth.) London, 1863. 8vo. pp. 225.

This volume contains twenty original communications. Abstracts of seven of these papers have been published in the numbers of this Journal for last year, in the quarterly summaries of improvements and discoveries in the medical sciences.

I. *Account of a recent remarkable case of Scrotal Elephantiasis, in which the tumour was removed.* By John Wiblin.—The subject of this history was a man about forty years of age, a native of Southampton, employed in the coasting trade from this port to several of the other ports of Great Britain. In 1844 he ruptured himself on both sides. In 1848 he contracted syphilis, and about three months afterwards the foreskin and integuments of the penis began to enlarge. From this period the scrotum also gradually increased in size, becoming hard, brawny, heavier, and more pendulous.

When the case first came under observation, in the fall of 1862, the abnormal growth of the prepuce and scrotum had attained the following dimensions: *Preputial growth.*—Length 16 inches; circumferences 13 inches. *Scrotal growth.*—Vertical circumference, from the symphysis pubis, following the raphé of the scrotum to within two inches of the anus, 3 feet 6 inches; lateral circumference 3 feet 14 inches. The weight of the mass, when suspended by means of a steelyard, was ascertained to be more than fifty pounds.

The removal of the diseased parts was decided upon and performed on the 21st of September. For the purpose of draining the parts of blood, they were kept elevated by tackling fastened to the ceiling, and to diminish the risk arising from hemorrhage, a large clamp, formed of two parallel bars connected by a screw at each extremity, was applied across the neck of the tumour, which was kept surrounded by ice for six hours before the operation. The external incisions were made along the dorsum of the penis to the symphysis pubis, and from thence on each side of the tumour to the most depending part of the mass. The left testicle was wounded during the performance of the operation and removed, and a hernial sac, occupied by several coils of intestine, which could not be returned within the abdominal cavity, was opened. The man died on the 26th, five days after the operation, from gangrene of the protruded gut.

The history of this case is accompanied by a tabulated summary of the chief recorded instances of elephantiasis of the scrotum, at least of those known to the reporter, and by notes from the observations of other surgeons upon the

disease. Several important memoirs have here been overlooked, as for instance those of Peixoto, of Bresil, in the *Mémoires de l'Académie de Médecine* (tome xix., Paris, 1855), of Clot-Bey, of Egypt, in the *Mémoires de la Société de Chirurgie* (t. iv.), together with the remarkable report of H. Larrey, contained in the volume last cited.

The unfortunate result of the attempt to remove the disease in this case shows the justness of the rule laid down, never to commence its extirpation before being assured of the reduction of protruded intestine. This paper is illustrated by a plate containing four figures, representing the different steps of the operation.

II. *Supplement to a paper entitled an Analysis of* 162 *Cases of Ovariotomy, which have occurred in Great Britain, published in Volume* XXXIV. *of the Medico-Chirurgical Transactions.* By ROBERT LEE, M. D.—This communication, together with a report of the discussion that followed its reading before the Society, will be found in the number of this Journal for January, 1863. From time to time, whenever the propriety of performing any doubtful operation is the subject of discussion before the profession, very singular and startling enunciations are made as to what is right or wrong in surgical morals. We do not consider that this is an occasion for entering upon this topic, but would express the regret that the moral rules by which surgeons are to be guided in the performance of operations are not better understood. Dr. Lee says that in the cases of ovariotomy called unsuccessful, the patients have been suddenly deprived of life by violence without any necessity. If this be so, the operator is guilty of a fearful error. In a subsequent paper (the xvth) in this volume, Dr. Lee, who maintains that ovariotomy is an unjustifiable operation, advocates the destruction of the life of the fœtus in certain cases of albuminuria. We believe ourselves that he may be right in one case, and that he is certainly wrong in the other.

III. *Case of Poisoning by Oil of Wormwood* (*Artemisia absinthium*). By WILLIAM SMITH.—From the symptoms witnessed in this case, where half an ounce was swallowed, it is evident that the oil of wormwood may be classed amongst the narcotico-irritants, causing stupor and insensibility, and at the same time producing local irritation of the mucous membrane of the stomach.

IV. *A contribution to the Natural History of Hereditary Transmission.* By HORACE DOBELL, M. D.—In this communication is given the history of a defect in the formation of the hands, continued through five generations. The defect consisted in great thickness of the joints of the fingers, and great crookedness in the ends of the ring and little fingers.

The deformity affected males and females indiscriminately; when it was inherited from the father it was most marked; and no instance had occurred where it returned after it had once been lost.

Dr. Dobell merely points out the leading peculiarities of this case, without referring to what is known to generally occur in similar cases of hereditary transmission of abnormities.

To us the most interesting point is the fact that in the fourth generation a marriage between two first cousins, both with the deformity, gave issue to children with perfect hands, as one exemplifying the law in regard to the duration of individual types.

V. *Case of a Woman with Three Hands; illustrated by analogous malformations in the lower animals.* By J. JARDINE MURRAY. Communicated by C. H. Moore.—The case of malformation reported in this paper is one of extraordinary interest, as no similar one has ever been described by unquestionable authority. St. Hilaire states that he does not know any well determined case of this anomaly in the human being, and that it has only been seen in animals with hoofs. (*Hist. Gén. et Part. des Anomalies de l'Organisation*, vol. i. p. 696.) He does indeed refer to a case recorded by Rueff of a child with twelve fingers to each hand and twelve toes to each foot (*De Conceptu et Generatione Hominis*, liv. v. chap. iii.), but adds that this work is ancient and not authentic.

The case reported by Mr. Murray is that of a woman, 38 years of age, whose

left upper extremity terminated in eight fingers. A plate by which the paper is accompanied gives a good idea of the double-hand, which cannot be given by any verbal description.

VI. *On the History and Progress of Ovariotomy in Great Britain; with observations founded on personal experience of the operation in fifty cases.* By T. Spencer Wells.—This communication will be found an interesting contribution to the literature of ovariotomy. Mr. Wells claims that the operation is one of British origin, which of course will not be admitted in this country.

VII. *Case of White Fibro-serous Discharges from the Thigh.* By A. B. Buchanan, M. D. Communicated by E. H. Sieveking, M. D.—An abstract of this paper is published in the number of this Journal for April, 1863. It is one of considerable importance from the light it seems to throw on the pathological nature of so-called chylous or chylo-serous discharges in general, as well as from the great rarity of such an affection.

This communication is accompanied by a plate representing the cutaneous surface of the thigh, the white discharge flowing, and the cellular elements in a portion of the coagulum.

VIII.—*Observations upon Syphilis, in its Manifestations as a Constitutional Disease.* By Jeffery A. Marston, M. D., Royal Artillery. Communicated by Henry Lee.—In a communication contained in the preceding number of the *Transactions*,[1] Dr. Marston has described the result of his observations upon syphilis in its primary forms. In the present one he treats of what are called the secondary and tertiary symptoms.

The evolution and succession of syphilitic symptoms as ordinarily witnessed among soldiers is thus succinctly traced:—

"After the true syphilitic primary sore upon the penis, the inguinal glands commence to become symmetrically enlarged and indurated, at a date corresponding, pretty accurately, with that of the induration appearing in the chancre. These chains of inguinal glands remain so affected for a very long time, and in spite of a course of mercurials, and, hence offer a reliable test as to an infection with syphilis at a previous date.

"The earliest constitutional occurrences after these, are—a gradually advancing chloro-anæmia, with, frequently, an engorgement of some of the cervical glands (particularly those in the posterior and lateral aspects of the cervical region), and vague muscular pains, simulating rheumatism. The anæmia becomes early marked, but it is obviously difficult to define the exact date of its appearance, or to say how much may be due to hospital treatment, &c.

"Enlargement of the posterior cervical glands I have traced as early as the fifth week from the date of the appearance of a primary sore, but it is generally nearer eight to twelve weeks that these can be discovered. They are much less frequently affected, and remain enlarged for a shorter period than those of the inguinal regions, and differ from them in feeling swollen only, without that well-defined hardness present in the latter.

"The rheumatic or osteocopic pains are not always nocturnal only in character, and vary very much in degree and amount. They sometimes simulate a fibrous rheumatism and affect the sheaths of tendons and muscles. Sometimes, however, they are distinctly nocturnal, and are attended with much tenderness along the course of the long bones; syphilitic nodes, however, rarely appearing.

"Often sore throat does not appear at all; when it does, it is one of the earlier symptoms. It varies in degree from a localized redness and congestion to one of extensive ulceration.

"In every case of infecting chancre, when not treated by specific remedies, that I have been to trace, some constitutional symptoms (however slight these might have been) have appeared within three months from the date of the primary disease.

"In the great majority of cases the syphilide of the skin makes its appearance after these premonitory symptoms, and without any pyrexia, and, at first,

[1] See the number of this Journal for April, 1863, page 402.

is so trifling in character as to escape the attention of the individual. It ordinarily appears in the form of a dull-red erythema, upon which the squamous and other forms of eruption develop themselves.

"In no disease of the skin are these affections of so mixed a character as in those caused by the syphilitic virus. Of course cases of unmixed and typical examples of psoriasis, lepra, &c., are common enough, but the majority will partake of more than one affection at the same time, and upon the same or different parts of the body.

"This commingling and admixture of eruptions of syphilitic origin is very peculiar, and renders their classification difficult.

"Iritis, under my observation, has appeared more frequently in the papular forms of syphilide than in the squamous or pustular.

"In the majority of instances (happily) no tertiary symptoms appear. After many relapses perhaps of the secondary symptoms, the patient slowly recovers. Of the remaining cases, some have tertiary symptoms, slight in degree; others, these symptoms very severe and difficult of cure. Of course, however, it requires that patients should be for years under observation before we can conclude that no tertiary symptoms have followed.

"I may here remark, that constitutional symptoms appear under two typical limits, which contrast with one another.

"Thus, a cutaneous syphilide, wide in extent and very superficial in character, denotes the milder degree of constitutional infection; while the discrete and localized morbid processes, affecting the deeper tissues of the skin and mucous membrane, have the opposite character of a severe degree of syphilitic infection.[1]

"With a view to prognosis, it is important to inquire: What relation (if any) has the severity of the primaries to those of the later symptoms?

"From a consideration of my own notes of cases, I should infer that the following would be as approximate expressions to the truth as the facts warrant.

"1st. That the greater the induration, and the longer the period during which primaries remained unhealed, the more certain will be the severity of the constitutional infection.

"2d. That the amount of ulceration, &c., of the primary sore stands in some relation to the worst and more intractable forms of secondary affections: *e. g.*, the pustular, ecthymatous, rupitic, the unhealthy ulcerations, nodes and gummatous tumours.

"If the preceding gives a rough outline of the ordinary course of syphilis, it must not be supposed that the evolution and succession of the stages and symptoms of that disease, as witnessed in the army, are always so regular.

"Assuming that when an indurated sore has been recognized by the army medical officer, some specific treatment has been applied, and that soldiers are exposed to changes of climate, we might infer, what is actually the case, that the constitutional symptoms would be irregular in their appearance, and varied in their kind.

"Instead of the regular course, we find that primary disease and affections of bones may, though very rarely, coexist, or the tertiary occur after the primary symptoms, without the intermediate stage; while symptoms, usually denominated secondary, may coexist with osteal affections; also, after variable but long periods often of apparent latency of the syphilitic element, there may be a sudden outbreak of constitutional symptoms; and lastly, a chloro-anæmic and cachectic appearance may be the only evidence of a syphilitic taint, without the appearance of the ordinary phenomena of that disease.

"An attack of constitutional syphilis so frequently appears in the soldier (after a period of latency of varying duration), consecutive to hospital treat-

[1] The results obtained from "confrontation" upon the continent tend to establish the doctrine of the two sores (soft non-infecting, indurated infecting) generating their like; but no observations have been yet made as to whether the severer and milder degrees of syphilitic infection result from different degrees of activity or potency in the virus—*e. g.*, as obtained from different stages of the disease furnishing such virus; or whether these depend upon some constitutional differences in the persons of the recipients of the virus.

ment for some disease unconnected with syphilis, that, I fancy, we may often conceive the latter to stand in the light of an exciting cause. A large proportion of men, whilst recruits, unfortunately suffer from primary sore. In some, the secondaries follow so speedily, and affect the constitution, development, and nutrition of the body so gravely, as to render them for years, or permanently, unfit for the performance of a soldier's duties; but with others it is far otherwise. The recruit in due course goes abroad, after having been specifically treated and cured (?) at home, and years afterward, perhaps, suffers from some disease incidental to the climate, or a pulmonary affection, from which he recovers by a tedious convalescence, during which symptoms of syphilitic disease make their appearance. Here, probably, the efficient cause has been the primary infection, the disturbing cause the treatment, and the exciting cause the last disorder, its treatment, or the confinement within the walls of a hospital."

Both of these papers of Dr. Marston are among the best of the numerous recent important contributions to our knowledge of syphilis.

IX. *Remarks on Two Cases of Kelis.* By Thomas Longmore, Professor of Military Surgery, &c.—This communication contains the careful description of two cases of kelis, with some remarks upon this rare and intractable affection of the skin. It is accompanied by a plate containing two figures representing the keloid growths as they appeared upon the back and chest.

X. *On a Remarkable Case of Lesion of the Medulla Oblongata, with Remarks, &c.* By A. T. H. Waters, M. D.—An abstract of this case, one of importance on account of its bearings on the views of physiologists with reference to the functions of some portions of the nervous centres, is published in the number of this journal for July, 1863. This communication is accompanied by a plate representing the lacerated portions of the medulla oblongata.

XI. *A Contribution to the Pathology of the Crura Cerebri.* By Hermann Weber, M. D.—An abstract of this interesting paper, giving the history of a case of hemorrhage into the left crus cerebri, and a careful comparison of the symptoms with those observed in similar cases, and with the result of vivisections, is published in the number of this journal for July, of the past year. A plate accompanies this communication showing the seat of the hemorrhage.

XII. *Description of a Fœtus born without heart, brain, lungs, or liver.* By William H. Dickinson.—An abstract of this paper, together with the remarks called forth by its reading before the Society, is published in the number of this journal for July, 1863. The communication is illustrated by two plates representing the fœtus previous to dissection, and the internal appearance when the trunk was laid open.

XIII. *Case of Extreme Deformity of the Neck and Forearm from the Cicatrices of a Burn, cured by extension, excision, and transplantation of skin, adjacent and remote.* Exhibited by John Wood.—The result of the different operations, executed by Mr. Wood in the case here related, is extraordinarily satisfactory, for very often after operations for the relief of deformity following the cicatrization of a burn the condition of the patient is not much improved. The communication will be found an instuctive one to any surgeon called upon to relieve in a case of the kind.

XIV. *Account of a Patient upon whom Ovariotomy was performed twice; with Remarks.* By T. Spencer Wells.—Mr. Wells, in this communication, gives an account of a case in which he removed an ovarian cyst from a woman, aged 42 years, about eight months after she had undergone a first operation of ovariotomy in the hands of another surgeon.

There was no unusual difficulty in performing the operation. The woman died on the seventh day from peritonitis.

Cases where ovariotomy has been performed twice on the same person are, and most probably always shall be, exceedingly rare.

XV. *On the Induction of Premature Labour in cases of Pregnancy, complicated with Albuminous Urine, Dropsy, and Amaurosis.* By Robert Lee, M. D.—The history of three cases recorded in this paper, is favourable to the

supposition that in cases of albuminuria with amaurosis, good results to the mother may be expected by the premature expulsion of the contents of the uterus. This, however, is not to be accomplished, in case the fœtus is living and not yet viable, without the taking the life of an innocent human being, under what we must consider entirely unjustifiable circumstances.

XVI. *Description of a New Iris Forceps.* Invented by W. R. BEAUMONT, Late Professor of Surgery in the University of Toronto, etc.—The iris forceps Mr. Beaumont submits to the consideration of the profession in this communication, has a fixed and a sliding blade, but differs from those generally in use, in more completely concealing the point of the hook, and more securely holding the piece of the iris taken up.

The instrument and the mode of holding it are represented by a wood engraving.

XVII. *A case of Strangulation of the Stomach in an Umbilical Rupture, and of death during its reduction under Chloroform.* By CHARLES H. MOORE. —An abstract of this interesting case is published in the number of this Journal for October, 1863.

XVIII. *A case of Transposition of the Great Vessels of the Heart.* By JOHN COCKLE, M. D. Communicated by Dr. Sibson.—The case related by Dr. Cockle is one, where after the existence during life of symptoms commonly witnessed in cases of transposition of the vessels, at the *post-mortem* examination the aorta was found to arise from the right ventricle, while the pulmonary artery sprang from the left. The superior and inferior vena cava entered the right auricle in the usual way; the ductus arteriosus was completely closed; the foramen ovale when stretched was largely patent.

The case is related in minute detail, not only as regards the symptoms witnessed during life, but also as regards the appearances observed at the post-mortem examination. The history is accompanied by highly interesting remarks, and moreover by tables giving all the known cases of transposition of the great vessels of the heart, with the principal features of each case. These tables are three in number: the first includes all those cases in which transposition of the vessels is associated with arrested development and malposition of the trunks of the main vessels; structural changes in the various orifices of the heart; deficiency of the ventricular septum; transposition of the ventricles and their valves.

The second comprises the cases in which transposition of the vessels is accompanied by patency, both of the foramen ovale and of the ductus arteriosus. The third table contains the few examples in which transposition of the vessels occurs with single patency alone of the foramen ovale.

The author's case, with three others, those of Gamage, Wistar, and D'Alton, are all that have ever been reported, where the only possible communication between the two sides of the heart, and consequently between the systemic and pulmonic circulation, was through the foramen ovale. It is very interesting to notice how perfectly they coincide in every important particular, at least in all such as have been noted by the observer.

This paper is illustrated by the plates containing three figures.

XIX. *A case of Popliteal Aneurism, cured by digital compression.* By GEORGE SOUTHAM. Communicated by Dr. Sibson.—An abstract of this communication is published in the number of this Journal for October, 1863.

XX. *Cases of Ichthyosis Spuria vel Sebacea.* By JOHN W. OGLE.—These cases occurred in the persons of two sisters, aged respectively ten and fourteen years, who resided a few miles distant from London, and who enjoyed good general health. A daily warm bath, with a lotion of diluted liquor potassæ, was speedily effectual in the removal of the thick scales of dirt and sebaceous matter to which the appearance similar to ichthyosis is due.

A plate accompanies this communication representing the appearance of the foot in one of the cases. W. F. A.

ART. XX.—*Guy's Hospital Reports.* Edited by SAMUEL WILKS, M.D., and ALFRED POLAND. Third Series, vol. IX. London: John Churchill & Sons. 1863. 8vo. pp. 343.

THE present volume of this valuable publication contains ten original communications, and eleven lithographic plates. As has been our practice, we shall lay before our readers a full analysis of its contents:—

I. *On the Syphilitic Affections of Internal Organs.* By SAMUEL WILKS, M.D.

It is known at the present day, that when syphilitic virus has entered the system, every tissue in the body may be affected, and always in one particular and characteristic manner. A low form of lymph, or fibro-plastic material, occasionally modified in character to a slight extent by the organ in which it occurs, may be, and sometimes is, everywhere effused in the internal organs as well as the external. The tumours of the solid organs are formed of circumscribed depositions of this albumino-fibrous material, which on the surface of the body may constitute merely the base and border of an ulcer. We see the same in syphilis as in cancer and in tubercle, masses of disease in the solid organs, and ulcers on the skin or mucous membrane.

This paper of Dr. Wilks is written with the object of affording additional proof of the correctness of these views of the venereal disease, by the publication of cases that have occurred at Guy's Hospital. According to his own statement, and for the reason that surgeons have almost exclusively treated syphilitic diseases, the profession in England is still sceptical in regard to the infection of the internal organs by the venereal virus.

In the treatise of Dr. Bumstead, the profession in this country have had presented to them an admirable digest of all that is now known concerning syphilis, and we have found nothing in the carefully prepared paper before us to point out as novel, or as calling for particular comment.

This paper is accompanied by four plates, representing the effects of syphilis upon the human body.

II. *On Pulsating and Aneurismal Tumours of the Abdomen.* By S. O. HABERSHON, M.D.

This paper contains the detailed histories of thirteen cases of aneurismal tumour of the abdomen, and of three of non-aneurismal but pulsating tumours. These latter three were respectively of cancerous disease of the glands behind the stomach, of cancerous disease at the pyloric extremity, and of suppuration in the lesser omentum.

These clinical observations are preceded by some general remarks on the subject of abdominal pulsating tumours that are highly interesting and instructive. Indeed, under the circumstances, they could not fail to be so.

The symptoms of aneurismal disease in the abdomen are regarded in three aspects by Dr. Habershon: *the negative signs, the character of the pain, and the character of the pulsating tumour.* As to the negative signs, there is a remarkable absence of constitutional disturbance, until the patient is worn out by the intensity and long continuance of the pain. This pain is a very constant indication of aneurism; it is of a double character, one constant and uniform, the other more intense and paroxysmal; the former is wearisome and distressing by its duration, the other agonizing in its severity. The first kind of pain has been attributed by some observers to erosion of the vertebræ, but Dr. Habershon believes it to be due to the distension of nerve-filaments upon the aneurismal sac. It is remarked by Dr. Stokes that erosion of the vertebræ may exist without pain, and pain may also exist without erosion.

The third characteristic sign of abdominal aneurism, the presence of a pulsating tumour, is thus described:—

"Aneurism generally occurs near the commencement of the abdominal aorta, in the neighbourhood of the cœliac axis, and the growth extends from this part; if the tumour enlarges upwards from the pelvis, it is more likely to be ovarian

or glandular. As the tumour passes downwards, it is more frequently found on the left than on the right side; but if the cœliac axis or the mesenteric artery be affected, the sac may be found to increase directly forwards. The pulsation is generally uniform, and is not removed by withdrawing the pressure from the abdominal aorta.[1] The uniformity of the pulsation is modified if the sac be situated behind the strong lumbar fascia, or if it contain much fibrinous deposit. The pulsation has also been shown by Dr. Lees to be diastolic in character, but it is sometimes very difficult to find an interval between the systole of the heart and the aneurismal impulse. A bruit may often be heard at the site of the tumour, but this symptom is not unfrequently absent; and the bruit, if present, may be systolic or double; generally, however, it is systolic. Dr. Corrigan has noticed that the murmur is at an early stage more distinct when the patient is in a recumbent than when in an erect posture, because there is less tension in the sac; but a tumour pressing upon the aorta often communicates a systolic bruit, and one which is more distinct in a recumbent position, on account of greater pressure being then exerted upon the vessel. When regurgitation through the aortic valves also exists, we might easily be misled by the presence of an abdominal bruit, for in such cases there is much arterial throbbing, and the lining membrane of the arteries is often diseased. It is remarkable, however, that aneurism of the abdominal aorta is much less frequently associated with disease of the heart than is aneurism of the thoracic aorta; the heart is in the former generally healthy, although we give several instances in which the reverse was the case (Nos. 8 and 9).

"Pulsation is not always equally distinct in abdominal tumours, for when occurring at the posterior part of the aorta, close to the diaphragm, and when the sac passes *beneath the strong lumbar fascia*, pulsation is very indistinct at the earlier stages, as in No. 1. When the tumour extends forwards impulse is more easily perceived, and it is generally felt in the left hypochondrium, or at the scrobiculus cordis. Occasionally it is first perceived in the loin, between the last rib and the crest of the ilium. As the sac enlarges, there may be visceral displacement, the liver may be pushed forward, so also the kidney, spleen, or pancreas. The thoracic viscera are also encroached upon, and dyspnœa and palpitation of the heart are induced."

Of course the diagnosis of pulsating tumours of the abdomen must be founded upon the correspondence of the symptoms presented with those described as characteristic of these tumours. In their cause, duration, and termination there is no striking peculiarity, that is, other than as aneurismal tumours. The treatment should consist in perfect rest, the allowance of a sustaining but unstimulating diet, the regulation of the bowels by the mildest aperients, or by enemata, and, if there be arterial excitement, the administration of the mineral acids with tincture of digitalis. In the relief of the suffering, belladonna sometimes gives a little alleviation; opiates, morphia, and chloroform are alike unavailing.

This paper is accompanied by a plate, containing two figures representing the specimens derived from a case where a localized abscess in the lesser omentum formed a pulsating tumour.

III. *The Stereoscope and Stereoscopic Results.* By JOSEPH TOWNE. Section III.

In this communication Mr. Towne continues the investigation entered upon in the last volume of the Reports, for the purpose of inquiring whether the stereoscope can be accepted as an exponent of ordinary vision, and whether the stereoscopic theory is consistent with stereoscopic results. The existence of any necessary physiological connection between corresponding points of the two retinæ, which the stereoscopic theory ignores, and which is the most important point in the whole subject, is the question specially treated in the present paper. From well devised experimentation, and by clear and convincing reasoning, Mr. Towne concludes that the binocular effect known as stereoscopic, is not only perfectly consistent with, but that it results from a *necessary physiological connection* existing between corresponding parts of the two retinæ.

[1] A good way to do this is to place the patient on his hands and knees.

The stereoscope is not, therefore, to be regarded as an exponent of normal vision. Stereoscopic vision requires a complete separation, a perfect isolation, of the eyes, so that the result should be regarded as a combination of *two monocular pictures*, rather than as the exhibition of one *true binocular* picture.

Two plates, one of which is coloured, is attached to this paper, in illustration of normal and of stereoscopic vision.

IV. *The Stereoscopic Test for the Retinæ.* By Joseph Towne. Section IV.

By means of the ophthalmoscope we are enabled to look into the eye, and see the visible signs of organic change. As a means of testing the state of vision, with reference to conditions which leave no mark upon the retinæ, Mr. Towne suggests an additional method of examination by the use of the stereoscope. With the assistance of this instrument the several divisions of the retinæ can be treated in detail, and we can discern precisely what each individual part of the eye can do.

Mr. Towne says:—

"It is, then, those phenomena that are beyond the reach of the ophthalmoscope that the stereoscope lays open to our view, and this, too, without submitting the patient to any painful examination, and by means so simple that they are within the reach of every intelligent observer. The great point in this method of examination consists in separating the different parts of the retinæ, and this is effected by bringing into simultaneous action those portions which are non-reciprocal. Thus, by means of the first slide, we obtain a distinct view of the two *nasal* portions of the field, so that we have the images of the two nasal sides of the retinæ, lying side by side, and by comparison we can detect the slightest difference between the two, down to a faint shadow or gray tint, which may frequently be observed upon the one side, while the other remains clear and bright; by means of the second slide, we obtain precisely the same results, with reference to the *temporal* halves of the retinæ; we may also observe that the portions of the retinæ brought into simultaneous action, being non-reciprocal, the impression upon the one eye does not in the slightest degree affect the impression upon the other eye, impressions upon non-reciprocal portions of the two retinæ being, we believe, perfectly distinct. Hence we obtain, without disturbing the concurrent action of the eyes, an exact knowledge in detail of the condition of every part of the retinæ, so far as they are brought into exercise in the stereoscopic field, while at the same time we gain the additional advantage of comparing each portion respectively with its fellow.

"It has been shown that non-reciprocal parts of the retinæ will, if the field be divided in accordance with these divisions of the retinæ, so far act in concert that the images referred to each side respectively will meet in the centre and form one *single* picture of the entire field; in short, that two slides may be prepared, omitting in the one slide the inner halves of the field, and omitting in the other slide the outer halves of the field, each of which, if viewed in the stereoscope, will represent the field in a single picture, this picture consisting of two distinct halves, and resulting from non-reciprocal halves of the two retinæ."

The forms of the slides, which will be found convenient for this method of examination, are very carefully described and represented by numerous figures, and their application is illustrated by practical examples, twelve cases being related.

Three plates are attached to this paper, illustrating the tests for the condition of the retinæ.

V. *Case in which a large quantity of Nitrate of Potash was taken medicinally.* Elimination of this salt by the Urine, with Remarks. By Dr. Wilks and Dr. Alfred S. Taylor.

In the case here related, one of renal dropsy, the patient, a man aged 34 years, took, in divided doses, between October 28th and December 26th, 1862, one pound twelve ounces and six drachms of nitrate of potash. In a period of fifty-nine days he took, therefore, a quantity of nitre amounting to twenty-eight fatal doses.

By chemical analysis it was found that 158.7 grains of the nitrate of potash were being carried out by the urine daily, while the patient was taking 270 grains

in three doses. About one half of the nitre, therefore, was eliminated by the urine. It is well known that large quantities of the neutral salts are carried out of the body by the intestines, and in this way we are to suppose the rest of the nitre to have been eliminated.

VI. *On the Cooling of the Human Body after Death. Inferences respecting the time of death. Observations of temperature made in* 100 *cases.* By Dr. ALFRED S. TAYLOR and Dr. WILKS.

By the amount of animal heat still present, the post-mortem rigidity, and the degree of decomposition, we judge, at the examination of a dead body, of the period at which death has taken place. It is not unfrequently a matter of great importance for the purposes of justice, as well as for other reasons, to determine this period with accuracy.

It is with a view of supplying some reliable information in regard to the preservation of the heat of the body that the authors of this paper have collected one hundred cases of deaths in Guy's Hospital, and noticed in their respective columns the age, and cause of death, the time of death, the temperature of the air, as well as the dryness or wetness, and the temperature of the body at one or more intervals after death. No special notes have been made with regard to the amount of post-mortem rigidity and degree of decomposition, except the body has presented something remarkable, in these respects.

A summary of the observations accorded in these tables leads to the following conclusions: If the periods of time be divided, first, into those which are included between two and three hours; secondly, between four and five hours; thirdly, between six and eight; and fourthly, twelve hours, including one or two cases extending to fourteen hours; then we find that the results are as follows:—

| | First period. | Second period. | Third period. | Fourth period. |
|---|---|---|---|---|
| Number of observations . . | 76 | 49 | 29 | 35 |
| Maximum temperature of body | 94° | 86° | 80° | 79° |
| Minimum temperature of body | 60° | 62° | 60° | 56° |
| Average temperature . . | 77° | 74° | 70° | 69° |

The temperature of the body was taken by placing the naked bulb of a good thermometer uncovered on the skin of the abdomen. As the coverings of the body have an influence upon the retention of its caloric, it may be stated that the practice in the dead-house at Guy's Hospital is to place the body in an open hall, and simply cover it with a shirt, shift, or sheet. It must be noticed, also, that the periods in the above table date from the time at which the bodies were received at the dead-house, and the temperatures, if dated from the time of death, would, therefore, be rather lower. In a body from which life has gone, the animal heat remains a longer or a shorter time, according to the age and more or less robust constitution of the subject, according to the disease or kind of death to which the person has succumbed, according to the surrounding temperature and the moisture of the air, and according to the heat conducting power of the materials with which it is in contact. "Sometimes the cooling of the body is complete at the expiration of one or two hours, at other times, it is only completed at the end of a day," is what we read in *Briand et Chaudé*, our favourite authority in matters of this kind; or one at least we have found as reliable as any other. By applying, in any given case, the information afforded by the paper before us, as respects the effects of the circumstances above mentioned in maintaining the heat in the body, something more definite than the statement of Briand and Chaudé may be concluded, but the most scrupulous care will be necessary.

VII. *On Tumours.* By THOMAS BRYANT.

The pathology of the new growths denominated in surgical language tumours, has been minutely studied and described. The chief object of Mr. Bryant, in this paper, being to point out the principal features by which one tumour may be distinguished from another, he makes use of their pathological features as a means of diagnosis, and applies the results of scientific knowledge and investigation to purely practical purposes.

This paper, which is one of very considerable length, occupying over fifty pages, is one we cannot analyze, but will simply direct attention to as interesting and instructive.

VIII. *Sebaceous Tumour within the Tympanum, originating on the External Surface of the Membrana Tympani, Bands of Membrane occupying the Cavity.* By JAMES HINTON.

In the number of this Journal for April, 1862 (page 468), in a review of the forty-fourth volume of the *Medico-Chirurgical Transactions*, attention is directed to a paper by Mr. Toynbee on sebaceous tumours in the external auditory meatus. These sebaceous tumours are there said to grow in the external meatus, and even to reach a considerable size, causing absorption of the bone, without the occurrence of pain. As a general rule the attention of the surgeon is called to them either on account of the deafness which follows the occlusion of the meatus, from the presence of a fetid discharge, or from symptoms of irritation of the brain, which too often terminates in death.

In the case related in this paper, one of these tumours implicating exclusively the membrana tympani, about the size of a pea, was found at the post-mortem examination of the body of a female, eighteen years of age, who had died of tubercular meningitis. During life there had never existed any symptoms to direct attention to the ear. The bands of membrane occupying the cavity of the tympanum were regarded as the remnants of a previous structure, which had incompletely wasted; as evidences of an imperfect "vacuolation" of the tympanic cavity.

This paper is illustrated by a plate containing two figures.

IX. *A Collection of Cases of Foreign Bodies in the Stomach and the Intestines.* By ALFRED POLARD.

In this paper Mr. Polard has collected all the cases he was able to find recorded of foreign bodies in the stomach and bowels. Some of them are exceedingly curious; one of them, that of the knife-eater, who died at Guy's Hospital, and which was reported by Dr. Marcet in vol. xii. of the *Medico-Chirurgical Transactions*, is perhaps as much so as any in medical literature.

Dr. Polard promises to consider the propriety of performing enterotomy and gastrotomy in such cases, in a future number of the reports when introducing a paper on penetrating wounds of the abdomen.

X. *Some Observations on the Iodic Test for Morphia.* By A. DUPRE, Ph. D., F. C. S.

When the morphia or its salts are in a solid state, Dr. Dupre recommends that a drop of starch should be added to the morphia, or the substances supposed to contain it, and the whole carefully evaporated to dryness. The dry residue left, after cooling, should be moistened with iodic acid, when it will assume a dark blue colour, which is still well marked, even though not more than $\frac{1}{10000}$ the grain of morphia be present. When the morphia is in solution, the mixture of morphia, iodic acid, and starch, should be allowed to stand for ten minutes, and then a very dilute solution of ammonia should be carefully poured upon the top of it. The $\frac{1}{10000}$th of a grain in solution will give a satisfactory reaction.

W. F. A.

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ART. XXI.—*The Surgical Diseases of Children; being the Lettsomian Lectures delivered before the Medical Society of London, March*, 1863. By THOMAS BRYANT, F. R. C. S., Assistant-Surgeon to Guy's Hospital, etc. etc. 12mo. pp. 148. London, 1863.

THESE lectures are devoted to a subject of no trifling importance, and which has not, in all its branches, received that special and separate consideration it demands. Although in the lectures of Mr. Bryant, only some of the more prominent particulars included within the scope of the surgery of infancy and childhood are briefly sketched, his teachings, as far as they go, will be found

replete with sound pathological views and correct practical directions. The lectures will be read with interest by every medical practitioner, and with especial profit by those in whose practice the surgical diseases of infancy and early childhood are the most frequently encountered.

The lectures of Mr. Bryant commence with a very brief sketch of the differences which are found to exist between the surgical affections of early and those of adult life. A difference that is dependent mainly on the greater activity of the vital forces during infancy and childhood, which are then, in great measure, directed for promoting the growth and development of the organism, and not, as in the adult, chiefly for the maintenance of structures which have already attained their full growth and entire development. It is to the abnormal direction given to one or other, or both of these natural processes of growth and development, that most of the special affections of infancy owe their origin.

"All malformations are, hence, according to the lecturer, but results of some defective power, either in the process of growth or of development, or of both; and they are always to be explained by the predominance, diminution, or abnormal manifestation of one or of the other. Hare-lip, fissured palate, monsters, cerebral tumours, spina bifida, etc., are to be explained by some defect in the natural development of the child; its growth and maintenance being, in the majority of instances, perfect of its kind; whilst instances may presently have to be recorded, in which growth alone has proved defective, development being perfect."

The greater activity of the vital process throughout the several organs of the body previous to the adult age—from birth, through infancy and childhood—renders them all particularly prone to take on morbid action; those tissues and organs in which development is progressing the most actively are also the most liable to become the seat of such morbid action.

The first of the surgical affections of the infant treated of by the lecturer is *hare-lip*. From his own experience, and reliable statistics within his reach, Mr. B. shows that hare-lip is always met with in the upper lip, and most frequently to the left of the median line; 63 per cent. of the cases occurring on the left side to 36 on the right. That it is more common in the male than in the female; in the proportion of 70 per cent. of the former to 30 per cent. of the latter. In the simple, uncomplicated cases, the proportions were found to be less marked, however; but as the cases become more complicated, the greater frequency of its occurrence in the male sex is more apparent; the proportion between the sexes being 80 per cent. and 20 per cent. It would also appear to be a rare thing to find a double hare-lip in a female child.

In operating upon uncomplicated cases of hare-lip, the following points are referred to by the lecturer as those which appear to be the most important: *First*, to separate the lip freely from the gum; *second*, to make a free section of the edges of the fissure; and, *third*, to bring the edges accurately together, not by pins, but by fine interrupted sutures, either of silk or wire, introduced at a distance from the wound's margin, and deeply placed.

The plan of operation to which preference is given by the lecturer, is one originally suggested, it is believed, by Malgaigne. By it, he asserts, the labial notch is, almost to a certainty, done away with, and the deformity most completely remedied. It consists in simply paring the edges of the fissure from above downwards, leaving the inverted flap adherent to the labial border. After the raw edges have been brought together and secured, "the lower flaps may be connected by a fine suture." If too long, they can be curtailed, so as just to leave sufficient to fill up the gap, which is too often the result of other plans of operating.

In cases of double hare-lip, the lecturer recommends that both fissures be operated on simultaneously. He has, he assures us, in no instance, witnessed any evil resulting from such a procedure, and is at a loss to understand why it is that surgeons still adhere, in cases of double hare-lip, to the old practice of a separate operation for each fissure, the second being postponed for an interval, after the first has been completed.

In some cases of hare-lip the central incisive or intermaxillary portion of bone is found projecting outwards, and interfering to such an extent with the opera-

tion as to prevent its performance altogether, or, at least, to prevent its success in the removal of deformity. In all such cases the lecturer advises that an attempt be made to press the projecting portion of bone backwards. If this can be effected by a moderate degree of force, he thinks it preferable to the removal of the projecting bone. If, however, the depression of the bone by force should prove impossible or inexpedient, there is no alternative but to remove the projecting portion by means of bone-forceps. It is true that, by removing the central portion of the maxillary bone, we destroy also the incisor teeth; but even this is preferable to allowing the original deformity to remain, especially when we remember that, if the projecting bone be left, the incisor teeth would, in all probability, appear much out of place, even to the extent of piercing the lip, a contingency which the lecturer had, in one case, seen occur.

"There is one other point in the treatment of these cases," remarks the lecturer, "which the surgeon should remember, viz., that if the first operation fail, and union by first intention cannot be procured, there is still a good hope of securing ultimate success by union from secondary adhesion. This end is to be obtained by the application of strapping, or, in preference, sutures to the granulating wound, so that the edges may again be placed in apposition. In several instances which have been tabulated, this practice was followed, and a good result took place. In two cases which came into his hands several years ago, equal success can be recorded. Both were infants, upon whom he had been led to operate at a very early period—two and three weeks only being their respective ages. Sloughing followed the original operation; and, when the parts had begun to granulate, sutures were re-applied, and a good recovery was eventually secured."

The next subject treated of by the lecturer is imperforate anus, or occluded rectum. The description given of the several forms of this congenital deficiency is confessedly borrowed from the excellent and exhaustive paper of Mr. Curling, published in the *forty-third volume* of the *Medico-Chirurgical Transactions*. The following are the lecturer's general deductions in respect to the treatment of imperforate anus:—

"In all cases, with some rare exceptions, whether of imperforate anus, obstructed rectum, or misplaced anus, an exploratory operation in the normal anal position is perfectly justifiable, and it may be attempted with the fair hope that, in nearly half of such cases, primary success will be secured. Such exploratory procedure, however, to be successful, must be conducted with great caution; the puncture or incision being made always in an upward and backward direction towards the sacrum.

"If these measures fail, or if, from some peculiarity in the case, they appear useless and unjustifiable, the intestine is to be opened in the groin: the lumbar or Callisen's operation being quite inapplicable. In the inguinal operation, the right groin appears to possess advantages over the left; as the intestine is found with more certainty, and the benefits to be be expected from the operation are equally great.

"The treatment of these cases does not terminate with the success of the primary operation—constant dilatation of the artificial anus is a necessity to preserve life."

In the second lecture we meet with some excellent remarks on injuries of the head in childhood. After pointing out the important fact that a child can bear blows and falls upon the skull with most surprising impunity—the anatomical structure of the bony centres in the child being such that they invariably receive the first impression of the blow or fall, and their membranous margins or fontanelles taking up the impulse, retard and stop the force of the onward vibrations; the brain in childhood is not, therefore, as a rule, so materially shaken by a slight injury as, in surgical language, to become the subject of a concussion—we are warned by the lecturer that, nevertheless, if concussion be experienced, the symptoms denoting cerebral irritation are generally well-marked and severe. When, also, once originated, the disposition to excessive reaction, or to inflammatory complications, is very great. Hence, the necessity of preserving absolute rest in even the slightest injury of the skull, even when no symptom of

brain-mischief exists. Besides the tendency of the brain in early life to take on diseased action, from the softness and want of consistency of its texture, it is, also, more liable than the brain in the adult to become the subject of ecchymoses from slight causes, and to this fact we are to attribute the frequency in childhood of cerebral symptoms from secondary inflammatory action.

Passing by the remarks of the lecturer on œdema of the larynx, from the swallowing of a boiling fluid, and on foreign bodies in the air passages, which, in respect to both subjects, though very concise, are pertinent, and especially practical; the same being true, also, in respect to the few words with which the subject of foreign bodies in the nostril is dismissed, we come to the important question, What, if any, are the points of difference to be noticed between the surgical affections of the chest during childhood, and those which occur in the adult? The lecturer is disposed to believe that the most important difference consists in the fact that, in early life, injuries to the thorax are more liable to be followed by laceration of the lung tissue, without the occurrence of any fracture or displacement of the ribs. This result he attributes to the greater elasticity of the thoracic walls in the child, and the greater ease with which the lung structure may be lacerated.

In treating of *nævus*, the lecturer very properly remarks that, unless it be so situated as to be an eyesore or an inconvenience, or it evinces an evident tendency to rapid increase, there is no necessity for surgical interference. The nævus will, to a certainty, after a time, cease to grow, and, in many instances, begin to waste away, and even finally to disappear.

In cases of diffused nævus, the lecturer expresses his partiality for the treatment by setons, which he prefers to that by injections. He states that it has proved of great value in his hands. If the nævus be large, several thick setons may be passed through the centre of the growth, but, in general, one or two will suffice. These will excite sufficient inflammatory action to close the enlarged capillaries, and to cause their subsequent and permanent contraction.

*Chronic enlargement, hypertrophy, of the tonsils* is more frequently met with in children than in adults. The lecturer pronounces it a disease essentially of debility, and to be treated by tonics, of which quinia and iodide of iron are undoubtedly the best. When the tonsils become very large, indurated, and pale, impeding deglutition and respiration, they should be excised. The lecturer has never seen any good result from the local application of nitrate of silver, iodine, etc., and has sometimes thought that it did harm.

In respect to *polypus of the rectum*, an affection much more frequent during early childhood than is generally suspected, the lecturer remarks, that in all cases of hemorrhage from the bowels in children, its existence is to be suspected, and a careful examination made. Polypus recti are generally met with in patients under ten years of age. In some cases the hemorrhage from the bowels is constant, the polypus will then be, in general, found just within, or perhaps protruding from the sphincter. In other cases, the hemorrhage will be only occasional, and to no great extent, accompanying or following, mostly, the act of defecation, though it may occur at other times. In examining children in whom the existence of rectal polypus is suspected, some care is required in order that the presence of the polypus may be detected. The best plan is to sweep the finger, passed well into the rectum, completely round the walls of the bowel. By a careless examination, unless the polypus is very large, it is almost sure to be overlooked. When detected, its removal is the only correct practice. In a large proportion of cases this may readily be done by simply hooking the finger over the pedicle and breaking it off. No hemorrhage or other evil consequences need be apprehended. In other cases, as when the polypus is high up or its pedicle thick and firm, it must be dragged down by means of forceps, or a wire noose, and then ligatured. After the growth is removed, a cure may confidently be predicted, provided the surgeon has satisfied himself that a second polypus does not exist.

We pass over the remaining subjects, briefly noticed in the second lecture, and direct attention to the remarks in the first section of lecture third, which is devoted to a consideration of the surgical affections of the osseous system in children, on *inflammatory disease of the shafts of the long bones*, which unfor-

tunately is very common in early life; the inflammatory process commencing, as we believe, in the greater number of instances in the periosteum. Unless when resulting from external injury, the disease will be met with most frequently in the cachectic and so-called strumous subjects It is generally slow in progress, and terminates usually in the death of the affected bone. There is often a very decided want of definiteness in the symptoms, which is apt to mislead parents, and render them dilatory in seeking professional advice.

In some cases the only external manifestation of the disease is an apparent gradual enlargement of the bone, while, externally, the surrounding soft parts are pale, but otherwise natural. It is only, perhaps, after the lapse of many months that any decided signs of mischief appear externally. If, however, the disease be not checked, death of the bone will take place, followed by inflammation and suppuration of the soft parts, ending in the formation of sinuses and a cloaca communicating with the diseased bone. The constitutional symptoms vary in intensity in different cases. In the majority they are very mild; little else than a dull aching over the inflamed part being complained of; a marked difference may be detected in the temperature of the part, the integument over the diseased bone feeling much hotter than in the neighbourhood. Firm pressure over the bone will, in all probability, cause increased suffering. The bone will generally be found enlarged, its external surface being smooth and uniform. At a later period, when the soft parts have become implicated and the bone necrosed, the local symptoms are too well marked to demand notice.

It is rare, the lecturer remarks, in cases of idiopathic ostitis, for a single bone alone to be affected. The symmetrical bones generally become, sooner or later, involved, and sometimes nearly all the long bones, showing the constitutional character of the disease. The disease, in children, does not invade the epiphyses.

The leading indication in the cure of the ostitis of childhood, is to improve the patient's general health by good living, good air, and tonics. As a tonic the syrup of the iodide of iron is pointed out as a good article in these cases. The inflamed limb must be kept raised and at rest. Warm fomentations afford much relief in the early stages. The lecturer has never seen any benefit result from the local application of iodine sufficient to compensate for the irritation and pain it occasions. Diseased bone should only be removed when it has become completely separated from its matrix. Too early attempts to interfere are only followed by harm, and should therefore be avoided. Amputation of a limb in cases of ostitis is rarely if ever required.

The lecturer describes very briefly a disease peculiar to childhood, namely, *inflammation of the soft, highly vascular, pulpy layer interposed between the shafts of the long bones and their epiphyses.* He thinks that a large proportion of the cases of acute suppuration about the joints in children have their origin in this layer, as is proved by the frequent exfoliation of some portion of the surface of bone in contact with it. If the inflammation involve the whole connective tissue of the bone, a general exfoliation of the upper portion of the shaft may result, or there may take place some arrest in the growth and development of the bone.

The disease is generally acute; it is manifested by morbid swelling at the affected part, attended by great pain and constitutional disturbance. An abscess next forms, which may rapidly encompass the joint and upper part of the limb. When the abscess has opened and discharged its contents, convalescence may result, or more frequently, a portion of bone, varying in size, will come away, and the parts heal kindly. In the majority of cases the disease appears at the shoulder-joint; it may occur, however, in any other articulation. The epiphysis itself is not often involved, the pulpy layer being more intimately connected with the shaft of the bone, the growth of which is effected through it, the epiphysis having an independent vitality and vascular supply.

The lecturer dismisses in a few words, under the denomination of "*green stick fracture*," that peculiar form of fracture to which infants are liable, in which the bone is fissured vertically into fibres, but not separated transversely. No credit is given to Dr. John Rhea Barton, of Philadelphia, who was the first to direct attention to this form of fracture, and point out its true character.

In treating of the diseases of the joints in children, the lecturer very truly remarks that there is scarcely any amount of mischief to the articulations which in early life is not remediable by natural processes, although it may be with anchylosis; the only exception, perhaps, is when any necrosed bone is present to keep up the irritation, and thus interfere with the process of cure. The chronic inflammatory affections of the articulations are essentially diseases of debility, occurring in children who are naturally frail, or who have been brought into a cachectic condition by an attack of fever or other exhausting disease. Let the general health of the patients be established, and the local affection will certainly improve also. The surgeon must, therefore, first of all improve the general condition of the child by hygienic means, good food, good air, suitable exercise, bathing, etc., aided by such tonic remedies as appear best adapted to each case; without this all local treatment will be futile. Specific remedies, as mercury, etc., may, according to the lecturer, be of service in some few instances; but such instances are few and far apart. In respect to local treatment in all joint affections, the diseased joint must be kept at perfect rest by means of an appropriate splint, which leaves the joint open for inspection, while the pain in the part is soothed by warm fomentations. Counter-irritation in children is hardly ever required, and must be employed with great care and caution. When only the effects of disease remain, firm, equal, and steady pressure will be found of decided advantage. The pressure may be applied by a proper application of strapping. There are few things which have a greater influence in causing the absorption of inflammatory deposit, and of thus restoring the parts to their normal condition. Very few cases of joint disease, occurring in children, require operative interference; as a rule, such interference is not only unnecessary, but mischievous. When, however, the bones are extensively involved, and have become necrotic, suppuration being kept up, and reparation prevented by the presence of dead bone; by the removal of this we insure a more complete and speedy recovery. It is in such cases alone that any operation is called for by local considerations. In certain cases, however, the general health of the child may fail under the continued local irritation, and his life be imperilled unless the latter be removed by an operation.

We have now presented an analysis, not of the entire contents of the volume before us, but of, perhaps, the more important of them. We have read the entire work with both pleasure and profit. The chief fault we have to find with the author, is the very brief manner in which most of the subjects embraced in his lectures are treated. What he has done, he has done well; we only wish that he had taken the time to fill up and perfect the very able outline he has given. The several cases interspersed throughout the lectures have been well chosen, and are admirably adapted to illustrate the author's teachings.

D. F. C.

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ART. XXII.—*Lectures on Medical Education, or on the Proper Method of Studying Medicine.* By SAMUEL CHEW, M. D., Professor of the Practice and Principles of Medicine, etc., in the University of Maryland. 12mo. pp. 152. Philadelphia: Lindsay & Blakiston, 1864.

THE term "medical education" is most commonly used in a restricted sense, to express the study of the elementary branches of medicine and of its collateral sciences; in other words, the pursuit of that preliminary knowledge the acquisition of which is essential to a successful entrance upon the proper study of medicine as a science and of its practice as an art. If the term medical education is not used in a sense quite so restricted as this in the lectures before us, yet it is only in its limitation to the studies to be pursued preparatory to an entrance upon the career of a medical practitioner that it is considered. And thus applied, the subject of medical education is discussed by Dr. Chew skilfully and profitably. No one who proposes to enter upon the study of medicine, or who has already entered upon it, can fail to be benefited by the practical remarks

of the lecturer, while by the adoption of the various judicious hints and councils with which the lectures abound, the medical novitiate will find his career facilitated and the desired goal more readily and certainly secured.

The leading subjects discussed in the lectures of Dr. Chew, are the talents necessary for the successful study and pursuit of medicine; the means for the acquisition of medical knowledge—reading, lectures, clinical instruction and conversation. These several topics are examined with great skill, while the conclusions at which the lecturer arrives are marked by sound sense; the absolute necessity of the strictest industry, even with the most ample means and the best arranged method, in the acquisition of every species of knowledge, being fully recognized.

The fifth and concluding lecture is devoted to the subject of medical schools, their advantages and defects. We copy from it the concluding paragraphs.

"The student should be on his guard against attaching undue importance to schools, and should understand that the character and quality of his medical education, whether good or bad, will depend not entirely nor chiefly upon the teachers by whom he has been usefully instructed, or by whom he has been neglected or misled. What the schools, even the best schools, can do for their pupils is trivial and insignificant in comparison with what the pupils can do for themselves, with what they must do for themselves, if they wish to acquire knowledge, ability, and fitness for their profession.

"I mean in thus speaking no disparagement to the schools; for I think highly of their value and ability. They are, no doubt, useful to many of their pupils. But they help only those who co-operate with them, and labour to help themselves. To such as cannot or will not assist themselves, no effectual assistance can be given by teachers, or by any other extraneous agents. The most important service that a medical school can afford its pupils, is to furnish them with the means and opportunity for the study of anatomy, and the means and opportunity for the study of diseases in the wards of an hospital. Other modes of assistance may be useful, but these are indispensable; and if these are supplied, the student will seek in vain for any valid excuse for an insufficient medical education.

"With opportunity for the study of anatomy, and of clinical medicine, and with the abundant supply of useful books on medical science which is now everywhere at hand, if the student continue in ignorance, it may be doubted whether any combination of external circumstances could have endowed him with the requisite qualifications for his profession. The deficiencies of his education will probably be found to depend upon causes nearer to himself than any negligence or incapacity of his teachers, and they would have been the same had he sat at the feet and listened to the teachings of the wisest Gamaliels of the present or any former age."

"In any of our schools, even in the worst, the student who will be faithful to his duty and interest, and will exert himself with energy and diligence, may obtain useful assistance and preparation for the successful prosecution of that part of his education, infinitely the most important of all, which he is to bestow upon himself and which consists in the intelligent observation and study of the facts which will be continually presenting themselves to his notice as long as he continues engaged in the practice of his profession. In any of our schools, even in the best, the student who inertly and passively depends upon his teachers, and hopes to learn science by proxy, and to become a physician without thought, effort, or labour, will be fatally disappointed, and will inevitably and utterly fail. This truth is so evident, that it seems almost idle to assert it; and yet, it is so often overlooked by students that a teacher cannot, without culpable neglect, omit to recall it to their attention. '*Non est ad astra, mollis e terris via.*' There is no royal road to Heaven, or to Geometry, or to Medical Science; and the schools have no power to construct such a road for their pupils. If for any reason, good or bad, whether honourable ambition, 'that last infirmity of noble minds!' or the pure love of knowledge for its own sake, or the pure love of knowledge for the sake of the power to do good, which its possession bestows; if for any of these, or for any other motive, you wish to be wise in the science

and art of your profession, remember that for this, or any other excellence or eminence in life, you must consent to pay the appointed price, and that price is labour, your own labour, and not the labour of your teachers." D. F. C.

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ART. XXIII.—*The Nervous and Vascular Connection Between the Mother and Fœtus in Utero.* By JOHN O'REILLY, M. D., F. R. C. S. I. Γνῶθι σεαυτόν. 8vo. pp. 76. New York, 1864.

THIS is a curious and interesting little treatise; and, like all the productions of Dr. O'Reilly, is replete with learning and original thought. Even where we cannot coincide with the correctness of the author's premises or the validity of his conclusions, we have to admire the plausibilty of his views and the ingenuity with which he attempts to sustain and enforce them.

The question as to the nature and extent of the connection which exists between the fœtus in utero and its mother,i s one, the solution of which has for a long period occupied the attention of physiologists, and has given rise to numerous hypotheses, all of which, after enjoying a brief period of popularity, have been, one after the other, rejected as untenable.

In the work before us it is maintained that between mother and fœtus there is both a nervous and a vascular connection. That branches of organic nerves accompany the minutest ramifications of the maternal vessels in the placenta and of those also of the fœtus, and that these two sets of nervous branches inosculate in the placental lobule, thus accomplishing the nervous connection; while the vascular connection between the mother and fœtus is effected, as between all of the tissues and organs of the body, by the interposition of capillary vessels: into those of the placenta terminate the uterine arteries of the mother, and the hypogastric arteries of the fœtus, and from them take their rise the uterine sinuses and the umbilical vein of the fœtus. These positions Dr. O'Reilly attempts to sustain, as well from the absolute necessity of the existence of a nervous and vascular connection between mother and fœtus, as from a variety of facts adduced, which he believes explicable only by the admission of such connection.

According to Dr. O'Reilly, the brain is composed of *hollow nerve fibres*, and the nerves, of *hollow nerve tubules*, which fibres and tubules communicate with each other. By the gray substance of the brain and of the spinal cord, which consists of organic glands, is secreted "a volatile or phosphoric agent," whose office is the stimulation of the nerve fibres of the brain and spinal cord and the tubules of the nerves, and which by passing into the nerve fibres of the brain rouses the mind to action, and passing onwards through the tubules of the nerves render the operations of the mind coextensive with the terminations of the nerves. Impressions made upon the animal, or cerebro-spinal nervous system, are communicated and made to extend to the organic or vital nervous system, by the inosculation of the nerves of the two systems with each other. Life being exclusively located, according to Dr. O'Reilly, in the ganglionic nervous centres, and in the ramifications of the nerves of the organic, or ganglionic nervous system, hence, as without the presence of organic nerves there could be no life, it is evident, therefore, that wherever there is life, organic nerves must necessarily exist, even although we cannot demonstrate their existence to the eye.

All this appears, at first sight, to be clear and conclusive—the only satisfactory explanation of the manner in which nervous influence is transmitted, from the central points of production of nerve power, to every part of the animal organism, and yet, when we come to consider it more nearly, we find it to be all a mere hypothesis based upon no possible show of evidence and opposed by numerous serious and incontrovertible difficulties.

To explain and illustrate the uses of the placenta, Dr. O'Reilly compares its structure and functions with those of the liver. Thus he points to the four sets

of vessels in the placenta as analogous to the four sets of vessels in the liver, in their distinction and functions. Both organs purify the blood; the number of vessels in each are the same. The blood of the hepatic artery is distributed to the liver, and the branches of the hepatic artery terminate in capillaries in the liver. The hepatic artery is surrounded by a retina of nerves, which can be traced on its coats as far as the transvere fissure of the liver. The vena porta carries to the liver the impure blood from the chylopoietic viscera; divides into branches which terminate in the liver. The trunk of the vena porta is surrounded by a retina of nerves which can be traced on its coats as far as the transverse fissure of the liver. The hepatic veins commence in capillaries and carry the blood, brought to the liver by the vena porta and hepatic artery, to the ascending vena cava. It is evident, therefore, that a union of the blood of the hepatic artery and vena porta takes place in the liver. The gall-ducts commence in capillaries, and carry the bile to the hepatic duct.

Now, as to the analogy which exists between the liver and placenta. The uterine arteries carry the blood from the mother to the placenta, they are surrounded by a retina of organic nerves, and terminate in capillaries in the placenta. The hypogastric arteries carry the blood from the fœtus to the placenta, and terminate in capillaries. The umbilical vein commences in capillaries in the placenta, and carries the purified blood to the fœtus. As the fœtus requires nutriment for its growth, it is evident that the umbilical vein must contain not only the blood furnished by the hypogastric arteries, but also some of the blood furnished by the mother—namely, blood as well from the uterine as from the fœtal hypogastric arteries, in the same manner that the hepatic vein contains blood derived from two different sources.

"It is evident that as pure blood is required to be united with impure blood in the liver, for the purification of the blood in that organ; so, in like manner, pure blood is required for the purification of impure blood in the placenta, and for the removal of carbonaceous matter. The uterine veins carry back the impure blood to the uterine sinuses, containing the impurities of the fœtal blood in the same manner that the gall-ducts carry the bile to the gall-bladder. The bile is secreted by the combined operations of the organic glands of the liver. The nerves are prolonged on the coats of the branches and capillaries of the hepatic artery, and the branches and capillaries of the vena porta, and form glands in the acini of the liver, where they must inosculate, inasmuch as it is by the union of the blood of the vena porta and hepatic artery that the blood is furnished to the hepatic veins.

"The branches of the vena porta accompany those of the hepatic artery in the structure of the liver. The uterine arteries pass from the uterine to the fœtal surface of the placenta, and then subdivide into branches. The hypogastric arteries, also, on arriving at the fœtal surface of the placenta subdivide into branches and capillaries.

"The blood is purified in the placenta by the combined operation of the organic glands in the placental globule. The nerves that surround the branches of the hypogastric arteries extend along the capillaries and terminate in organic glands. The nerves which surround the uterine arteries, are, also, prolonged in the branches and capillary terminations of the latter—terminating in glands which inosculate with the organic glands at the termination of the capillary hypogastric arteries. The purification of the fœtal blood is due to the operation of the organic nerves derived from fœtus and mother. Throug' the capillaries of the umbilical vein the pure blood is conveyed to the fœtus, while through the uterine veins the impure blood is carried back to the uterine sinuses."

In the earlier months of gestation the fœtus of the human subject is supported by the absorption through the lymphatics of the chorion of the sanguinolent fluid secreted by the mucous membrane of the uterus. But in the latter months, inosculation takes place between the uterine and hypogastric arteries, and also between the organic nerves which surround those respective sets of arteries, thus establishing both a vascular and nervous connection between the mother and fœtus.

We have presented our readers with a general sketch of the views inculcated by Dr. O'Reilly in respect to the nature of the connection which exists between

mother and fœtus, and the manner in which that connection is effected through the placenta. The entire subject, as presented in the work before us, is well deserving of a close and candid study. In the views advanced by the author there is not a little semblance of truth. They are plausible, to say the least of them, and while they explain sufficiently well important points in the physiology of fœtal life they run counter to no well established anatomical fact or physiological law.

That any shock imparted to the nervous system of the mother may affect injuriously the fœtus, we believe to be a truth well established, but that the nervous connection which exists between the mother and fœtus can, under any circumstance, become the medium by which the development of the latter can be so modified as to bring it in conformity with certain objects that have happened to strike forcibly the mind of the mother or to daguerreotype upon the skin of the fœtus forms transmitted to it from the optic nerve of the mother we are not prepared to admit, inasmuch as we have met with no fact which gives to such a supposition even the remotest semblance of truth. D. F. C.

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ART. XXIV.—*An Introduction to Practical Chemistry, including Analysis.* By JOHN E. BOWMAN, late Professor of Practical Chemistry in King's College, London. Edited by CHARLES L. BLOXAM. Third American from the fourth English edition. 12mo. pp. 333. Blanchard & Lea, 1864.

THE above work, originally intended to supply a deficiency in elementary practical instruction, has, by the successive editions, become so well known to our chemical public, that any notice beyond the fact of the appearance of a new and revised form would be unnecessary, were it not that in consequence of the decease of the talented author the supervision of the work has devolved upon his successor in the London School of Practical Chemistry, Charles L. Bloxam. This gentleman is favourably known to us as the author of a very acceptable work on inorganic chemistry, and in the present case has fully sustained his previous impression, by the judicious alterations and additions he has made to the *Practical Chemistry* of Professor Bowman.

The most extensive and important alterations to be noticed are those made in part third, chapter one, treating of the qualitative analysis of substances of unknown composition. The directions for the mode in which the student should proceed in his examination is laid down in accordance with strict method and in compliance with the lessons of experience, examining and noting carefully first the physical then the chemical characters. In the form of typography adopted in this edition the eye is at once caught by the circumstances to be specially noted and the conclusions to be drawn therefrom; the former being indicated by broad faced type, and the latter by italics. The whole of this section has been rewritten and rearranged, still commencing with the more simple cases in which one metallic and one non-metallic element is present, and thence passing to the more complicated examples afforded by the higher branches of analysis. The alterations and additions in other parts are of a minor character, but may be considered as affording additional means and information to the student, and as facilitating his researches in special subjects. Thus, in the preparation of gases a convenient method is given for drying; in the purification of reagents the most usual impurities are noticed, and directions given for their amendment; new methods of investigation are introduced, as Fresenius' and Babo's, for arsenic; the volumetric estimation of sesqui-compounds of iron by solution of permanganate of potassa, and the proper means of detecting the principal organic alkalies. In the examples given for the student, to enable himself to acquire confidence and improvement by practice, there have been added some which are well calculated to effect this object, by the care and attention involved in the discrimination of the import of the results, and consequently of great practical utility.

The size of the work has been enlarged by these alterations nearly fifty pages over the former edition, and evinces the usual neatness and correctness of previous publications, with the exception of a single instance (easily corrected) of malposition of an illustration, Fig. 19, which has been turned a quarter of a circle from its proper position. R. B.

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ART. XXV.—*On Human Entozoa: Comprising the Description of the Different Species of Worms found in the Intestines and other Parts of the Human Body, and the Pathology and Treatment of the various Affections produced by their Presence.* By WM. ABBOTTS SMITH, M. D. 8vo. pp. 251. London, 1863.

THE above is the title of a work recently from the London press which, though not so elaborate a treatise as the excellent manual of Küchenmeister, translated and published by the Sydenham Society, yet is perhaps better adapted for the general practitioner, so far as it goes. Dr. Smith treats in his volume of the human entozoa alone, while the work of Küchenmeister includes an account of the epizoa and the vegetable parasites. Dr. S. gives a concise and accurate account of our knowledge to the present day, together with the best known method of treatment, and his work may be perused with advantage by the physician and medical student. J. L.

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ART. XXVI.—*British Pharmacopœia, published under the direction of the General Council of Medical Education and Registration of the United Kingdom pursuant to the Medical Act*, 1858. London: Printed for the General Medical Council, 1864. 8vo. pp. 444.

WE have neither the leisure nor the space, at this time, to examine into the merits of this work; but it has been so long and anxiously looked for that it appears incumbent upon us to at least announce its appearance. "To supersede three Pharmacopœias, each of them long held in great repute—to reconcile the varying usages, in pharmacy and prescriptions, of the people of three countries hitherto in these respects separate and independent—to consult the prepossessions of three important professional bodies, which have ruled long and ably over this branch of medicine, to represent accurately, yet with caution, the advancement made in chemistry and pharmacy during the thirteen years which have elapsed since the last edition of any of the Pharmacopœias of the Colleges of Physicians was published," the council state "has been no light task."

The work consists of two parts and an appendix. The first part consists of the materia, medica; the second of the preparations and compounds; and the appendix of articles which are employed for the chemical processes in the second part, but are not themselves used in medical practice, and of preparations solely intended for the chemical examination of articles contained in the first and second parts.

Five years were occupied in the preparation of this work, and the cost of it is said to have exceeded thirty thousand dollars. Whether or not the result justifies this expenditure of time and money we may at some future period consider; but in the mean time we may state that the work does not seem to have been received with general favor in Great Britain. In an editorial in the *Lancet* (Feb. 27, 1864) it is stated that "although the Pharmacopœia bears ample evidence of the great ability, large therapeutic information, and great chemical skill which distinguish its able authors, yet it is disfigured by practical mistakes." And Prof. Redwood, in a lecture delivered before the members of the Pharmaceu-

tical Society, stated, according to the journal just quoted, that no worse punishment could be desired for the authors of the Pharmacopœia than to be shut up in a laboratory until they had made the monohydrated glacial acetic acid which they order by the process which they prescribe; that in the directions for preparing hydrochloric acid they had forgotten the application of heat; that in ordering monohydrated sulphuric acid they had ordered that which could not be well prepared by the process given. nor used in pharmacy if prepared; that the new carbonate of potash of the Pharmacopœia was as difficult to prepare by the directions given as it was difficult to keep when made; that citrate of iron could not be scaled in the way described; that the collodion was a mess; and that the spirit of nitric ether was directed to be obtained from a substance practically unattainable by the process given or by any existing process."

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BIBLIOGRAPHICAL RECORD.—Several works have recently appeared, which want of space and the short period that has elapsed since their reception prevent our noticing particularly at present, but which on account of their importance we deem it our duty to call attention to at once.

First of these is a new edition of the very able treatise on Human Physiology, by Prof. John C. Dalton, Jr., M. D. This edition, the third, is revised and enlarged, and the subjects all posted up to the day. We shall notice it more particularly in our next number.

Next we would ask attention to a new edition, the third, of a Treatise on Pharmacy, by Edward Parrish. This edition is very considerably enlarged and the officinal preparations are in conformity with the new edition of our National Pharmacopœia.

We have been very remiss in not noticing, before this, "Physiological Memoirs by Wm. A. Hammond, M. D.," the scientific and able Surgeon General U. S. A. Though most of them originally appeared in this Journal and are, it is to be hoped, familiar to our readers, we ought to have announced their appearance in a collected form. These memoirs have secured for their author, reputation abroad as well as at home. They have been most favourably reviewed in the last number of the *British Foreign Medico-Chirurgical Review*. The reviewer states, "as a whole, they impress us favourably with the candour, accuracy, and ability of the writer. He enters on his inquiries in the true spirit of the experimental physiologist, and duly impressed with their importance." Again he says:—

"In expressing the high sense we entertain of the work, we must not omit to point out the goodness of its style, so clear and simple, and so appropriate to the matter, nor, though briefly given, the information he affords of what has been accomplished by others in the same field of research."

Outlines of the Chief Camp Diseases of the United States Armies as observed during the Present War, by Jos. Janvier Woodward, M. D., Ass. Surg. U. S. A. It was expected that this interesting volume would be reviewed in the present number, but unavoidable circumstances prevented the completion of the review in time, and it has been laid over until our next issue. In the mean time we invite attention to the volume which contains much of importance.

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES

IN THE

# MEDICAL SCIENCES.

## ANATOMY AND PHYSIOLOGY.

1. *The Colourless Corpuscles of the Blood.*—Dr. Lionel Beale presented to the Microscopical Society of London, Jan. 13th, 1864, a paper on these corpuscles, which he prefaced with a few remarks, stating that as the paper was too long to be read *in extenso* he would endeavour to give the pith of it. He commenced by stating that the germinal or living matter, of which all nuclei, and in some cases what had been termed cell-contents consist, always exhibited a tendency to assume the spherical form: that whatever shape this germinal or living matter was made to take by pressure of external matter, if placed in a fluid about its own density, it always becomes spherical. The white corpuscle of the blood, like other forms of living matter, if carefully watched, may be frequently detected forming projections or outgrowths upon its surface, almost like the amœba. The moving power, Dr. Beale thinks, resides in the most minute particles of this living or germinal matter, and that although contained granules may be observed in active motion, the movement communicated to them by the minute spherical particles of living matter does not depend upon the mere molecular movements of the granules themselves. Dr. Beale believed the little highly refractive particles which give to the white blood corpuscle its granular appearance, to be dead formed material, resembling fibrin—for whereas the living germinal matter could be coloured by a solution of carmine, the granules could not, and this he looks upon as a test for the germinal matter. In a clot of blood, stellate cracks are often seen between the surrounding coloured corpuscles converging towards a colourless corpuscle. He believes their appearance to result from the white corpuscle absorbing nutrient material from the *liquor sanguinis*, the cracks or fissures being the channels through which the streams of nutrient matter flowed. In inflammation the increase of white corpuscles in the capillaries is enormous, and Dr. Beale believes they have the power by budding of increasing in number, even after the death of the animal. In favour of this view he instanced the case of a clot of blood, which, if examined immediately after death, would be found to contain a certain number of colourless corpuscles, but when examined a few hours later a greater number might be observed. He also stated that the periosteum of the fang of an inflamed tooth was a very favourable position for observing the formation of white corpuscles in young vessels. Dr. Beale believes that the white corpuscles multiply in the circulation, especially in such positions where it is slow and sluggish—for instance, in the spleen. He thinks that they are formed from the germinal matter of the walls of the vessel, as well as by subdivision, and the formation of buds on the part of the white corpuscles. D. Beale then entered upon the "Exudation" and "Cell" theories, as applied to morbid products in inflammation. He thought that minute living particles passed through the stretched walls of

distended capillary vessels, and that these living particles grew and increased in the exudation after its escape. Hence he could accept neither theory, since the "exudation" contained solid living particles, but these living particles could not be considered "cells," for they had not the structure, nor were they produced in the manner which those who accept the cell theory believe cells to result. He then stated, that besides the white and red corpuscles of the blood, the *liquor sanguinis* contains an enormous number of the extremely minute particles just referred to, and he hazarded the opinion that it was such living active particles that we were to regard as the active animal "ferments" which give rise by the so-called "catalysis" to contagious and infectious diseases, as smallpox. These germs might pass in a living state from one person to another, and multiply. There could be no more interesting field for investigation than this. He then went on to state that every living particle is derived from some pre-existing living or germinal matter; that the formed material on the other hand was dead matter; and that in it chemical and physical changes occurred, but not the so-called *vital actions;* the latter being confined to the germinal matter alone. The living germinal matter of the white corpuscles in the blood, if allowed to die very slowly, under certain conditions became resolved into the hæmato-crystalline of which the red blood corpuscles were composed. This, as is well known, readily assumes the crystalline form. If the death of the living matter occurred more quickly, the result was fibrin, so that the formation of fibrin was a vital process—in fact, that the germinal matter in dying became fibrin. Dr. Beale then introduced the theories of Professor Lister on the coagulation of the blood; and although disagreeing in his views, yet spoke most highly of his labours, and regretted that English reviewers, who were enabled to give lengthy and elaborate criticisms upon the works of foreign observers, passed over with a few words of approval or dissent the labours of their fellow-countrymen. Dr. Beale thought that there was more real conscientious physiological work done in Great Britain than many supposed.—*Dublin Med. Press*, Feb. 3, 1864, from the *Electrician*.

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2. *Variety of the Muscles of the Axis, Atlas, and Occipital Bone.*—Dr. JOHN STRUTHERS showed to the Medico-Chirurgical Society of Edinburgh a dissection in which the muscles which normally arise from the spine of the axis were shifted down to the spine of the third vertebra. The spine of the axis wanted its usual bifurcation and great size. The rectus capitis posticus major muscle arose entirely at the spine of the third vertebra. The recti minores were normal between the atlas and occiput. The interspinales muscles were absent between the atlas and axis, but present between the axis and third vertebra. The obliquus inferior muscle arose in its great bulk at the spine of the third vertebra, and this at first appeared to be the entire muscle; but a portion, about one-fourth the size of the lower, was then found coming normally from the spine of the axis, lying deeply on the lamina, and joining the large portion above its middle. The obliquus superior was normal. At first the attachment of the rectus major and obliquus inferior at the third vertebra seemed to be directly to a massive spinous process; but, on dissection, it became evident that, while the spine of the third vertebra was larger and more largely bifid than usual. the muscles were fixed to it indirectly, that they were attached to a thin flat oval sesamoid-like bone, resembling a rather small-sized almond. This epispinous bone was attached to the corresponding tubercle of the third spine by a strong ligament, and by ligamentous fibres to its fellow of the other side. The interspinales muscles in the space between the third vertebra and axis were large, and seemed also to be attached below entirely to the epispinous bones; but there was a deeper and smaller pair of interspinales, which were attached directly to the spine of the third vertebra. The muscles which normally pass from below to the spine of the axis, were attached to the third spine through the epispinous bones instead of reaching up to the axis.

This was undoubtedly a very singular variety. Looking to the absence, as usual, of interspinales in the space between the first and second vertebræ, and their presence in the space between the second and third, while the recti majores were at the same time attached below the latter space; and looking also

to the fact that the obliquus inferior retains a small head of attachment to the spine of the axis, we must draw the conclusion that the epispinous bones represent the two tubercles which are usually developed from the spinous process of the axis, for the attachment of the rectus major and obliquus inferior muscles above, and, below, for the semispinalis and other muscles. But it remains a question how these tubercles came in this body to be separate, and to be shifted down to the spine of the third vertebra, carrying their muscles with them.—*Edinburgh Med. Jour.*, May, 1863.

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## MATERIA MEDICA AND PHARMACY.

3. *Quinia as a Local Antiseptic.*—Dr. R. Gieseler has been led to adopt the use of quinia as a local antiseptic. From experiments which he made, he found that the preservative property exerted on fresh meat by pure quinia (not the sulphate only) was greater than that of many other substances including even cinchona. He therefore determined to apply quinia in surgical cases; and his first case was one of extensive carbuncular inflammation in a man aged 25. The whole of the lower half of the left calf, including the upper third of the tendo-Achillis, was in a gangrenous state, which threatened to extend round the limb. At the upper part, the soft structures were destroyed to the depth of about an inch; and the tendinous portions of the gastrocnemius were being thrown off in shreds, with ichorous discharge. The fibres of the tendo-Achillis, where diseased, appeared as if macerated; and the edges of the whole tendon were undermined. The leg was much enlarged; its skin had a bluish red colour; and the soft parts were indurated. The diseased parts exhaled a most offensive smell, filling the small room in which the patient lay. He kept the knee flexed, so that the leg rested on the thigh; and it was scarcely possible to bring the limb even to a right angle. The patient suffered continuous pain in the whole leg, and especially in the foot; he had loss of appetite, fever, and profuse sweats. The disease had commenced four weeks previously as a very tender black spot on the skin, and had been treated, by the practitioner called to the case, by warm applications, and, after the separation of the slough, by ointment of nitrate of silver, and subsequently by oil of turpentine and by myrrh ointment. The gangrene, however, spread in depth and in circumference. Dr. Gieseler first endeavoured to improve the patient's health by tonics, especially cinchona; and, as applications to the limb, he employed effusions and bandages soaked in a strong decoction of poppy-heads with opium. As no improvement was produced by the continuance of this treatment during eight days, he determined, as a last resource before performing amputation, to try the effect of the local application of quinia. Accordingly, a solution of this substance was applied in compresses over the entire gangrenous parts, the whole being covered in with warm poultices. During the first week, the internal remedies were continued. In the course of the first day, the pain abated, and the patient passed a tolerably quiet night. A change in the appearance of the parts could not naturally be at once expected; but the separation of the dead parts took place very gradually. At the end of three weeks, the separation was complete at the upper part, and healthy granulation was commencing; the diseased portions of the tendo-Achillis, were not thrown off until a later period. The process of cicatrization went on favourably, and was complete three months after the patient first came under Dr. Gieseler's care. The man ultimately recovered the perfect use of his leg. Dr. Gieseler says that on several occasions, for the sake of experiment, he omitted the quinia, and used warm applications only; the result always was, that the pain was renewed.

The next case related is one of noma, occurring in a child three years old. Dr. Gieseler was called to this patient on account of an ulcer at the right corner of the mouth: this was, however, found to be connected with gangrenous disease of the cheek, which was much infiltrated, and, although the skin was un-

affected, gave on examination signs of being destroyed in its entire thickness. When Dr. Gieseler attempted to raise the lip carefully, for the purpose of examining its inner surface, laceration of it near its middle and of the right ala nasi took place without hemorrhage, and showed these parts, as well as the external surface of the alveolar border of the upper jaw, to have been changed into a gangrenous mass, having an offensive smell. The thickly infiltrated gangrenous parts were removed by incisions made from the lacerations already described upwards to the infraorbital process, and thence obliquely downwards and to the right. No hemorrhage took place. To the exposed dirty gray anterior surface of the upper-jaw, in which no trace of organization was apparent, Dr. Gieseler applied a sponge soaked in solution of sulphate of quinia, over which he laid some wadding, and secured the whole with a bandage. The right nostril was kept open by means of a piece of sponge, also soaked in quinia solution. On the next day, a dark brown border, a line in width, had formed at the inner and upper part (near the canine fossa) where it was found the sponge had not rested; but there was no extension of the gangrene elsewhere. The applications were renewed every few hours, the parts being carefully cleansed by affusion on each occasion. Healthy granulations appeared at the edges of the wound on the second day. Even at this time, when the process of separation first commenced at the centre of the exposed surface, the offensive smell had ceased; and neither then, nor subsequently, did the child appear depressed, but took its food readily and played as usual, although confined to bed. No internal remedies were given except an occasional mild aperient, when indicated. The child was first seen on October 9th; and on November 11th the process of cicatrization was complete, leaving the parts in so satisfactory a state that a trifling plastic operation alone was required to remedy the defect that remained.

Dr. Gieseler has used in some cases of bed-sores, an ointment of quinia (the sulphate being first dissolved in a few drops of water and then mixed with lard); and has found a quinia gargle useful in some cases of diphtheritic throat-ulcer. In young children, the remedy must be applied by means of a camel's hair brush; and the use of the same means of application is also indicated for other parts, such as the cornea and uterus.

Quinia is also useful as a local application in the after-treatment of plastic operations, which sometimes fail through death of the transplanted parts. It is, however, perhaps advisable to scarify these, so as to allow of the action of the quinia. The following case is given: On June 27th, Dr. Gieseler saw a little girl aged 6 years, who had undergone a remarkable injury of the left hand in attempting to swing herself to a loaded cart. The nature of the injury was such that the integument was stripped from the entire palm of the hand, from the wrist to the fingers; and the flap remained connected at the finger-joints. The flap was replaced; and, to keep it properly extended, sutures were applied; the limb was laid in a lukewarm water-bath, and was subsequently dressed with solution of quinia. On July 4th, the corners of the flap—making altogether about one-third—had become separated, but without any gangrenous odour. The remaining part spontaneously divided into three strips. On July 17th, these had become firmly adherent; and the hand was placed in the extended position on a splint. At the end of this month the wound was entirely healed; there was but slight contraction of the cicatrix, and the child recovered the perfect use of her hand.

In caries and necrosis also, Dr. Gieseler, after performing the necessary operations, applies quinia locally, and believes it to be useful. This, however, he says, is open to further inquiry, as the successful result in many cases may be dependent on the constitution of the patient. It is suggested, also, that the local application of quinia may be useful in the sloughing of malignant tumours. Dr. Gieseler, however, has no experience to bring forward on this point.—*British Med. Journ.*, Jan. 23, 1864, from *Archiv fur Klin. Chirurg*, Bd. IV. heft 3.

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4. *Carbolic Acid as an Antiseptic and as a Local Application in Favus.*—Dr. JAMES WATSON has experimented with this article in the Royal Infirmary, Edinburgh.

He tried carbolic acid as a disinfectant lotion, he states, "in two cases, in the

surgical wards. In the first case, the patient, a young girl about 13 years of age, was suffering from a sloughing ulcer extending from the knee to the ankle. There was a large amount of discharge of the most fetid character. On the application of the carbolic acid as a lotion, one part of acid to forty of water, the very disagreeable fetor was completely destroyed. Nothing could be more satisfactory than the complete manner in which the disgusting odour was dissipated. The lotion also acted as a stimulant to the part, which to a certain extent took on a healthy action, but in consequence of the amount of discharge exhausting the already very weak constitution of the girl, amputation was deemed her only chance of recovery, and this was accordingly performed.

"The other instance in which I had carbolic acid applied as a lotion was in the case of a young man who had amputation performed at the middle of the thigh for malignant disease. Very soon after the operation, sloughing set in, accompained with a fetid discharge. On the application of the lotion, the fetor, as in the first case, was most completely destroyed, the discharge lessened, the sloughs separated, and the parts beneath looked healthy. The lotion continued to be used for several days with the best results as far as its disinfectant and antiseptic qualities were concerned, but unfortunately the patient died, never having thoroughly recovered from the shock of the operation."

Dr. W. also, in conjunction with Dr. Smart, made a number of experiments on the urine to test the antiseptic property of carbolic acid.

These experiments, he states, "conclusively show that carbolic acid is a decided antiseptic, that a very small quantity prevents for several weeks the odour of decomposition, that a slightly increased quantity diminishes the amount of deposit, and that a very little more entirely prevents any recognizable change in the composition of the urine from taking place."

Dr. Watson next draws attention to a case of favus treated with carbolic acid in the clinical wards.

"Peter Russel, æt. 14. On admission, head was found completely covered with favus crust, and on microscopic examination the parasite—*achorion Schönleini*—peculiar to this disease was discovered. The boy's head was shaved and then poulticed for two days. A solution of carbolic acid in glycerine (in the proportion of one part of the acid to twenty-five parts of glycerine) was then ordered to be applied to his head, morning and evening, and to be continued daily.

"Before the application of this lotion the entire scalp was of a crimson colour, but under this treatment the colour of the scalp became gradually fainter, and at the end of five weeks distinct tracts of scalp quite free from redness were found, and the remaining parts were much paler in colour. The hair is now growing vigorously, and over the whole surface of the scalp not a trace of the favus crust can be detected.

"The boy's general health is much improved since coming into the hospital.

"So satisfactory was the result obtained in the last reported case considered, that the same treatment is now being pursued in another case of favus, with this difference, that in this instance the lotion is stronger, being composed of one part of acid to fifteen of glycerine.

"The young man, Peter Ward, æt. 17, has had the disease for nine years. On admission his head was covered with favus crust. The head having been shaved and poulticed, the above lotion was applied as in the former case, morning and evening. After being treated in this way for fourteen days the scalp was seen to be much less red and the hair growing vigorously. At the roots of the hair there are still small circumscribed patches of crimson scalp, but no trace of crust is to be found over the entire head."—*Ed. Med. Journ.*, Jan., 1864.

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5. *Veratrum Viride.*—Dr. James Watson was induced by the representations of Dr. Cutter to experiment with this article. A few of his experiments were made with the tincture prepared by Dr. C., the others with that made by Duncan and Flockhart. He states that his "experience distinctly denies *Veratrum viride* to have sedative properties. It can depress, as I have shown, most thoroughly; but that it can, under ordinary circumstances, be of use as an arterial sedative, I unhesitatingly deny. Dr. Fordyce Baker, of New York,

maintains that it acts specifically as an arterial sedative, without depressing the vital powers. This statement I must distinctly contradict; and on the other hand maintain, that it is by depressing the vital powers, and that in the most marked and painful manner, that influence on the circulation is obtained. That a drug so potent in inflicting pain, and so inert till extreme nausea is induced, should ever find a place in British medicine as an arterial sedative, is exceedingly improbable. The drug may have virtues we know not of; but this, after many careful experiments, we do know, it has no arterial sedative quality. And while we have such a sedative as aconite to rely on, it will be most strange if, even for a time, practitioners should be so unwise as to neglect it on the bare assertion that there is a better."—*Ed. Med. Journ.*, Jan. 1864.

6. *Tinctura Boleti Laricis Canadensis.*—This is a new remedy highly recommended by Dr. Grant as a remedy for rheumatism. Dr. JAMES WATSON states (*Ed. Med. Journ.*, January, 1864), that he has used it in one case of rheumatic fever, without any effect.

7. *Sarracenia Purpurea.*—Dr. JAMES WATSON has experimented in eight cases of smallpox, in the Royal Infirmary, with this newly vaunted Canadian remedy for smallpox, and found it absolutely inert.—*Ed. Med. Journ.*, Jan. 1864.

8. *Turpentine as a Styptic.*—Dr. WILKS believes that turpentine does not hold the place among styptics which its merits deserve. He has long been in the habit of giving it, and often found it arrest hæmoptysis when other ordinary remedies had failed: he has also seen it very beneficial in one or two cases of purpura hemorrhagica.

9. *Physiological Properties of Nitrite of Amyle.*—Dr. B. W. RICHARDSON read a paper on this subject before Sub-section D, of the British Association. He first described the mode of manufacture and the chemical properties of the nitrite, and then passed on to the physiological action. The first remarkable fact was that the nitrite when inhaled produced an immediate action on the heart, increasing the action of the organ more powerfully than any other known agent. As the action of the heart rises, the surface of the skin becomes red, and the face assumes a bright crimson colour. A little of the nitrite was here placed on a piece of bibulous paper, and passed round to show the effect on the face, and the effect was most remarkable, causing the faces of the persons who smelt the vapour to become instantaneously flushed. Carried to an excessive degree, the nitrite excites the breathing, and produces a breathlessness like that caused by sharp running or rowing. On animals, when the agent is given in large quantities, death is produced. The author at first thought that the nitrite, like chloroform, would cause anæsthesia; but experiments had shown that this view was not borne out. Animals would, it is true, lose consciousness; but when such a stage was reached, great dangers resulted, owing to the slowness by which the poison was removed from the body after its absorption. On the blood the nitrite produces darkness of colour, but it does not materially interfere with coagulation in the body. In the lungs it excites congestion, and in the brain slight congestion. It causes no severe spasm and no sickness. After entering into certain other details, Dr. Richardson proceeded to say that the most remarkable effect produced by the nitrite was that in the lower animals—frogs, for instance—it led to suspended animation, which could be maintained for so long as nine days with perfect after-recovery. This fact was of curious historical interest. The ancients, especially Theophrastus (Paracelsus), had stated that there was a poison which, when taken one day would not take effect until some future day. This statement, long considered as a myth, had within the present year been shown to be true by Dr. Letheby, who had discovered a poison which really produced this phenomenon. In like manner the ancients had an idea that there were medicines which would for a time suspend life. The proceeding of Friar Lawrence in giving the distilled liquor to Juliet, was based on this old fiction, or shall we not say fact? The next point discussed

by Dr. Richardson had reference to the mode of action of this poison. Were the effects produced through the blood, or by the nerves direct? The speaker said that he had been led to the conclusion, from previous experiments, that all poisons were brought into action through the blood; but this very commonly accepted theory did not explain the immediate and powerful action which follows the exhibition of the minutest dose of the nitrite of amyle. He thought, therefore, that the action was immediately on the nervous system, and that such action, transferred to the filaments of nerves surrounding the arteries, paralyzed the vaso nerves, on which the heart immediately injected the vessels causing the peculiar redness of the skin and the other phenomenon that had been narrated. Dr. Richardson, in conclusion, said that nitrite of amyle, like to chloroform twenty years ago, was only to be considered a physiological curiosity. It might by its action suggest the cause of trance, and of what was called hysterical unconsciousness, and it might explain the mode by which certain analogous substances produced their effects on the organism. It had been suggested—naturally suggested—that in fainting, as from loss of blood or from fear, the inhalation of the nitrite of amyle might be of service. He (the author) did not, however, at the present moment recommend its use in medicine, because of the intensity of its action. This last point was at the present time under his inquiry, and he would report further results at the next meeting of the Association.—*Med. Times and Gaz.*, Sept. 26, 1863.

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10. *Liquor Bismuthi.*—Mr. Chas. R. C. Tichborne read before the Pharmaceutical Society in December last the following account of a new preparation of bismuth, which is getting much in vogue in Great Britain, and is highly spoken of by many practitioners:—

"Under the name of Liq. Bismuthi there has been introduced to the notice of the faculty a preparation, which purports to possess great advantage over the ordinary basic nitrate. The desirable points in this preparation are—first, its solubility; second, its slight taste; and third, its alkalinity. It has also the peculiarity of not being precipitable by water.

I felt the desirability of such a mode of exhibiting bismuth, and therefore made an analysis of the solution for my own information; and as it possesses certain phases of interest, I now take this opportunity of placing it before the members of the Pharmaceutical Society.

A qualitative analysis elicited the following: The solution contained bismuth, citric acid, and ammonia; not a trace of nitric acid could be detected in the solution. Liq. bismuthi is therefore probably a solution of a basic salt, having a composition analogous to $3MOCi+MO$; one of the bases, MO, being replaced by $BiO_3$; it is made from the recently precipitated and well-washed oxide. From the peculiarity of having to deal with an alkaline bismuthic solution, direct precipitation with sulphide of ammonium was employed to determine the amount of bismuth present; this gave, on washing and drying, 0.327 grammes of $BiS_3$ in the fluid half-ounce, which represents 1.114 grains of the teroxide as being present in the drachm. Now, although the circular which accompanies the liq. bismuthi states that ʒj is equivalent to a full dose (fifteen to twenty grains) of the insoluble trisnitrate, I do not think such can be the case. The idea evidently is that the metal, when in the soluble form, is much more active than the ordinary insoluble modification, and there can be no doubt that it is so to a certain extent; but I should consider three grains to the drachm as the minimum dose; even more than this quantity may be easily introduced into such a solution as the above. The following is probably the mode pursued in making this solution: 430 gains of metallic bismuth are dissolved in a sufficient quantity of nitric acid, and this solution of ternitrate of bismuth is then precipitated with ammonia, and the resulting hydrated oxide well washed; 480 grains of citric acid are then exactly neutralized with ammonia, and the moist oxide is gradually added to the boiling solution of citrate of ammonia. The oxide is slowly but perfectly taken up. Ammonia is slowly evolved during the boiling (probably from the decomposition of the citrate of ammonia *per se*), but the solution becomes slightly acid, and remains so until the completion of the process. The solution is then neutralized with ammonia, and the whole is made to measure one pint. This

solution will contain three grains of $BiO_3$, to the ʒj. It is more elegantly made by dissolving the citrate of bismuth in citrate of ammonia.[1]

Tartaric acid has also a similar action upon bismuth.

There seems to be a limit to the solubility of chemically pure citrate of bismuth; but the solubility is wonderfully increased by the presence of mineral acids. This is no doubt due to the greater solubility of the salts formed by the latter acids in citrate of ammonia.

The reactions of this bismuthic solution are as follows:—

Ammonia and carbonate of ammonia give no precipitate. Potash and soda, or the carbonates of these alkalies, give precipitates insoluble in an excess of the precipitant. Nitric, sulphuric, and hydrochloric acids give precipitates soluble in an excess of the respective acids, and reprecipitable on neutralization with ammonia. These precipitates are also soluble on the further addition of ammonia. Water gives no precipitate. Sulphide of ammonium throws down the whole of the bismuth as sulphide.

As the reactions of citric and tartaric acids are at present little known, it is my intention to investigate the matter further, particularly with a view to its analytical bearing; but in the meantime I place before you the results of my investigation of the liq. bismuthi.

Mr. Schacht (of Clifton) said that although the author of the paper had not thought fit to mention his name in connection with the liquor bismuthi examined, there could be no doubt, from the quotation made from the circular, that the preparation the meeting had just heard so freely discussed was that made by himself. Assuming this to be the case, he could state that the author had well performed his task in submitting it to analysis. The preparation sold as liquor bismuthi (Schacht), consisted of bismuth oxide, citric acid, and ammonia, and the quantity of oxide of bismuth present was one grain in the drachm. This, however, had been published in the *Lancet* several months ago (?). A fact so easy of investigation he had never attempted to keep secret, but on the contrary he had told its composition to every medical man with whom he had conversed on the subject. He had adopted the name "Liquor Bismuthi (Schacht)," partly because having been fortunate several years ago in discovering this elegant method of holding bismuth in permanent solution, he was anxious to reap some measure of reward in the credit which would attach to so distinct an improvement as he believed this preparation to be; and partly also because as the article can only exist in the form of solution, it was convenient that the profession should be invited to prescribe a medicine of one definite strength. In answer to the author's suggestion that it should be made three times as strong as he (Mr. Schacht) had been accustomed to make it, he would observe that the quantity indicated as a dose—one drachm—was easy both to remember and to dispense, and he had abundance of evidence to prove that in such doses it was efficient, in many cases succeeding where full doses of from five to twenty grains of the trisnitrate had failed. He claimed the credit, such as it was, of having been the first to prepare and introduce to the profession a permanently fluid form of bismuth, and as his preparation had been a good deal employed during the last five or six years it would be a great pity to alter its strength."—*Dublin Med. Press*, Jan. 20, 1864, from *Pharm. Journ.*

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## MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

11. *Trichiniasis in Germany.*—In the original department of this Number will be found an interesting account, by a correspondent, of the recently dis-

[1] Citrate of bismuth is a very insoluble salt, got by the double decomposition of citrate of potash or soda, and ternitrate of bismuth. The citrate, as made in this manner, is extremely soluble in ammonia or a solution of citrate of ammonia.

covered disease produced by the presence of Trichinæ in the human system, The *British Medical Journal* for Jan. 16, 1864, contains some additional details, which we transfer to our pages, as we are confident they will interest our readers.

"A few months ago, there was a festive celebration at Hettstädt, a small country town near the Hartz Mountains, in Germany. Upwards of one hundred persons sat down to an excellent dinner, and, having enjoyed themselves *more majorum*, separated, and went to their homes.

"Of these one hundred and three persons, mostly men in the prime of life, eighty-three are now in their graves; the majority of the twenty survivors linger with a fearful malady; and a few only walk apparently unscathed among the living, but in hourly fear of an outbreak of the disease which has carried away such numbers of their fellow-diners.

"They had all eaten of a poison at that festive board, the virulence of which far surpasses the reported effects of *aqua tophana*, or of the more tangible agents described in toxicological text-books. It was not a poison dug out of the earth, extracted from plants, or prepared in the laboratory of the chemist. It was not a poison administered by design or negligence. But it was a poison unknown to all concerned; and was eaten with the meat in which it was contained, and of which it formed a living constituent.

"When the festival at Hettstädt had been finally determined upon, and the dinner had been ordered at the hotel, the keeper of the tavern arranged his bill-of-fare. The introduction of the third course, it was settled, should consist, as usual in those parts of the country, of *Rostewurst und Gemuse*. The *Rostewurst* was, therefore, ordered at the butcher's the necessary number of days beforehand, in order to allow of its being properly smoked. The butcher, on his part, went expressly to a neighbouring proprietor, and bought one of two pigs from the steward, who had been commissioned with the transaction by his master. It appears, however, that the steward, unfortunately, sold the pig which the master had not intended to sell, as he did not deem it sufficiently fat, or well-conditioned. Thus the wrong pig was sold, carried on a barrow to the butcher, killed and worked up into sausages. The sausages were duly smoked and delivered at the hotel. There they were fried and served to the guests at the dinner-table.

"On the day after the festival, several persons who had participated in the dinner were attacked with irritation of the intestines, loss of appetite, great prostration, and fever. The number of persons attacked rapidly increased; and great alarm was excited in the first instance by the apprehension of an impending epidemic of typhus fever or continued fever, with which the symptoms observed showed great similarity. But when, in some of the cases treated by the same physician, the features of the illness began to indicate at first acute peritonitis, then pneumonia of a circumscribed character, next paralysis of the intercostal muscles and the muscles in front of the neck, the hypothesis of septic fever, though sustained in other cases, had to be abandoned with respect to these particular cases. Some unknown poison was now assumed to be at the bottom of the outbreak; and an active inquiry into all the circumstances of the dinner was instituted. Every article of food and material was subjected to a most rigid examination, without any result in the first instance. But when the symptoms in some of the cases invaded the muscles of the leg, particularly the calves of some of the sufferers, the description which Zenker had given of a case of fatal trichinous disease was remembered. The remnants of sausage, and of pork employed in its manufacture, were examined with the microscope, and found to be literally swarming with encapsuled trichinæ. From the suffering muscles of several of the victims small pieces were excised, and under the microscope found charged with embryonic trichinæ in all stages of development. It could not be doubted any longer, that as many of the one hundred and three as had partaken of *Rostewurst* had been infested with trichinous disease by eating of trichinous pork, the parasites of which had, at least in part, escaped the effects of smoking and frying.

"This awful catastrophe awakened sympathy and fear throughout the whole of Germany. Most of the leading physicians were consulted in the interest of the sufferers, and some visited the neighbourhood where most of the afflicted

patients remained. But none could bring relief or cure. With an obstinacy unsurpassed by any other infectious or parasitic disease, trichiniasis carried its victims to the grave. Many anthelmintics were arrayed to destroy, if not the worms already in the flesh, at least those yet remaining in the intestinal canal. Picric acid was employed until its use seemed as dangerous as the disease; benzole, which had promised well in experiments upon animals, was tried, but was unavailing. As case after case died off, and the dissection of each proved the parasites to have been quite unaffected by the agents employed, the conviction was impressed upon every mind that a man afflicted with flesh-worm is doomed to die the slow death of exhaustion from nervous irritation, fever, and loss of muscular power, in systems essential to existence.

"But medical science had only just unravelled a mystery; and if it could not save the victims, it was determined, at least, to turn the occasion to the next best account. The cases were, therefore, observed with care, and chronicled with skill. All the multifarious features of the parasitic disease were registered in such a manner, that there can hereafter be no difficulty in the diagnosis of this disorder. A valuable diagnostic feature was repeatedly observed—namely, the appearance of the flesh-worm under the thin mucous membrane on the lower side of the tongue. The natural history of trichina in man was found to be the same as that in animals.

"All observations led to the conviction that the trichina encapsuled in the flesh is in the condition of puberty. Brought into the stomach, the calcareous capsule is digested with the flesh, and the trichina is set free. It probably feeds upon the walls of the intestines themselves; for the irritation of the intestines begins before the bringing forth of young trichinæ has taken place. Copulation is immediately effected; and within a few hours, or a short portion of days, from sixty to eighty live embryos leave the female, and begin their own career of destruction.

"This consists, in the first instance, in an attempt to pierce the walls of the intestinal canal. Great inflammation of the entire surface ensues, ending not rarely in death of the villous or mucous membrane, or in the formation of masses of pus on its surface. Sometimes there are bloody stools. But these severe symptoms only ensue when much trichinous meat has been eaten. When less has been consumed, pain and uneasiness in the abdomen are produced, accompanied, however, in all instances, by wasting fever and prostration. The embryos actually pierce the intestines, and are found free in the effusion, sometimes serous, sometimes purulent, which is always poured out into the abdominal cavity. Thence they again proceed towards the periphery of the body, pierce the peritoneum, causing great irritation, and sometimes peritonitis, to the extent of gluing the intestines together to a coherent mass. They next proceed to the muscles nearest to the abdomen; arrived at the elementary muscular fibres, which, under the microscope, appear as long cylinders with many transverse striæ, they pierce the membranes, enter the fibres, eat and destroy their striated contents, consume a great part of the granular detritus, moving up and down in the fibres until grown to the size necessary for passing into the quiescent state. They then roll up in spiral or other irregular windings, the bags of the muscular fibres collapse, and only where the trichinæ lie a calcareous matter is deposited, perhaps by the trichinæ themselves, which hardens into perfect capsules round the parasites. A muscular fibre may harbour one or several parasites; but every fibre invaded by a single parasite loses its character entirely, and becomes a bag of detritus from one end to the other.

"If it be remembered that one ounce of meat filled with trichinæ may form the stock from which, in a few days, three millions of worms may be bred; and that these worms will destroy in the course of a few weeks not less than two millions of striated muscular fibres—an idea of the extent of destruction produced by these parasites can be formed. We are not in a position to say to what proportion of the fifty or sixty pounds of muscle required for the performances of the human body these two millions of elementary fibres actually amount. In the muscles nearest to the abdomen, the destruction is sometimes so complete, that not a fibre free from parasites can be found. This amounts to complete paralysis. But death is not always produced by the paralysis; it is mostly

the result of paralysis, peritonitis, and irritative fever combined. No case is known in which trichiniasis, after having declared itself, became arrested. All persons affected have either died, or are in such a state of prostration that their death is very probable.

"Most educated people in Germany have, in consequence of the Hettstädt tragedy, adopted the law of Moses, and avoid pork in any form. To some of the large pig-breeders in Westphalia, who keep as many as two thousand pigs, the sinking of the price of pork has been a ruinous—at the least, a serious—loss. In the dining-rooms of the hotels in the neighbourhood of Hettstädt, notices are hung up announcing that pork will not be served in any form in these establishments. To counteract this panic, the farmers' club of the Hettstädt district gave a dinner at which no other meat but pork was eaten. But it has had no appreciable effect. The raw ham and sausages of Germany are doomed to extinction. The smoked and fried sausages must necessarily be avoided.

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"In the South of Germany, some people now say that the Hungarian pigs are most frequently affected with trichinæ. This rumour, like the famous pork dinner of the farmers' club, may, however, have been set up with the intention of quieting apprehension about the native pigs. We have already mentioned the accident which befell the crew of a merchant vessel. They shipped a pig at Valparaiso, and killed it a few days before their arrival at Hamburg. Most of the sailors ate of the pork in one form or another. Several were affected with trichinæ and died. Of those whose fate could be inquired into, one only seems to have escaped the parasites. Another outbreak in Saxony has carried away twelve persons. A fourth wholesale poisoning by trichinæ is just reported from Offenbach, the Birmingham of Hesse-Darmstadt. Of upwards of twenty persons infected, three had already died when our correspondent's letter left. Numerous sporadic cases of fever, and epidemics of inscrutable peculiarity, but referred to an anomalous type of fever, are now claimed by medical authors, and with much show of reason, to have been outbreaks of trichiniasis, or flesh-worm disease. Several German physicians experimentalized with a view of finding a cure for this terrible disorder. Professor Eckhardt at Giessen, we are told, has obtained permission to try the disease and supposed remedies upon a murderer under sentence of death. We have not been told whether his reward in case of success is to be a commutation of his capital sentence; but should hope this to be the case. The experiment, even if it should not have the romantic character indicated, will probably teach some curious details of the life of these parasites. Almost everywhere, the commonest rules of cleanliness are disregarded in the rearing of pigs. Yet pigs are naturally clean animals, avoiding, like dogs and cats, all contact with ordure. Though they burrow in the earth, and in summer wallow in the mud, they abhor the heaps of excrements mixed with straw in and upon which they are frequently kept. A due regard to cleanliness will prevent trichinæ in the pig. In wild boars, of which many are eaten in the country round the Hartz Mountains, trichina has never been found. Neither has it been met with in sheep, oxen, or horses. Beef is the safest of all descriptions of meat, as no parasites have ever been discovered in it. They have also never been found in the blood, brain, or heart, of those animals in whose striated muscles they love to reside."

12. *Hæmaturia at the Cape of Good Hope due to the presence of Parasites.*—Dr. John Harley read before the Royal Medical and Chirurgical Society (Jan. 26, 1864) a very interesting account of some cases of hæmaturia due to the presence of parasites belonging to the genus *Distomum* or *Gynæcophorus*.

In the beginning of October last, a gentleman, resident in the Cape, consulted the author about a slight hæmaturia which he had had for some years. After micturition a little blood, never exceeding a teaspoonful, or some dark "veins," appeared with the last half ounce of urine. The urine itself was never bloody. Sometimes the "veins" would block up the urethra, and cause obstruction for a few minutes. He had an occasional twinge of smart pain in the loins. These were all the symptoms that ever appeared in connection with the urinary apparatus. He said great numbers of people of both sexes were affected in pre-

cisely the same way in certain parts of the Cape. While awaiting a sample of his urine, Dr. Harley made inquiries amongst his Cape friends and acquaintances; and, as the result corroborated his patient's statements, he was now satisfied of the existence of endemic hæmaturia in Nitenhage and Port Elizabeth, and it remained for him to ascertain the cause. In the various samples of urine sent to him by his patient, he invariably detected the eggs of an entozoon; and in one specimen he had the good fortune to discover the perfect embryo after its escape from the eggshell, under the form of a minute, ciliated animalcula. From its anatomical characters and developmental changes he was led to refer the parasite to the *Tremotode* class of worms, and to the family *Distomum*. Of the five species of this genus which inhabit man, it had no relation with three. *Distomum heterophyes* presented some points of resemblance, viz.: in the size and conformation of the alimentary canal, if he (Dr. Harley) might be allowed to compare it with an organ he met with in one sample of his own, and which he supposed to be the intestinal canal of the adult parasite. But the animal which it seemed to most nearly resemble, in the outward form of the eggs as well as in the symptoms of the disease it produces, was the *Distomum hæmatobium*. This parasite, according to Bilharz and Griesinger, was very common in Egypt, and inhabited all parts of the urinary apparatus. But since the parts he had described differed in several respects from the corresponding parts of the *hæmatobium*, and since, from want of recorded information respecting the corresponding parts of *D. heterophyes*, he could not compare them with these, he was obliged to comprehend them under a new species, which he would call *D. capense*. Having finished his observations of this case, he was strongly persuaded that the hæmaturia of the Cape was due to the parasite, the early stage of whose development he had been able to observe; but still, as its presence in a single case might be nothing more than a coincidence, he felt that more extended observations were needed to prove that this was the constant cause of the local disease in question. With singular good fortune he had the pleasure of an introduction to Mr. Dunstroville, Surgeon to the Port Elizabeth Infirmary, and who, having practised for twenty-seven years in the Cape of Good Hope—which was one of the two places in which he (Dr. Harley) found the hæmaturia to be endemic—was quite familiar with the disease, the cause of which, however, from want of leisure and means of observation, had never been ascertained. Mr. Dunstroville's two sons, in common with most other young men, suffered from the disease, but considered themselves to be now free from it. At the author's request, Mr. Dunstroville kindly supplied him with samples of their urine, and he (Dr. Harley) was at once enabled to demonstrate to Mr. Dunstroville the existence of the characteristic eggs of the parasite in question in the secretion from both. Having thus demonstrated the existence of the same parasite in three individuals suffering or having suffered from the hæmaturia endemic in some parts of the Cape, Dr. Harley concluded that the animal was the constant cause of the disease.

Dr. COBBOLD remarked that no person who had previously familiarized himself with the appearances presented by the eggs of the various distomes could doubt for a moment that Dr. John Harley's illustrations represented the ova of the so-called *Distoma hæmatobium*. In short, the symptoms, pathological products, eggs, and embryos described by Dr. Harley, all tended to show that this hæmaturia of the Cape was identical with the well-known Egyptian malady. Dr. Harley's discovery was, however, a most important one in relation to the geographical distribution and prevalence of entozootic diseases; for the author had now demonstrated, in a most satisfactory and able manner, that the helminthiasis in question was not confined to Egypt, as had hitherto been supposed, but was more or less prevalent in Southern Africa and in the Mauritius. Speaking zoologically, this parasite was not a true distome, as it represented the type of a distinct genus, to which Diesing, of Vienna, gave the name of *Gynœcophorus;* Weinland, of Frankfort, had called *Schistosoma;* Moquin-Tandon had denominated *Thecosoma;* and himself had previously entitled *Bilharzia*, after the name of the original discoverer, Dr. Bilharz, of Cairo. He (Dr. Cobbold) had discovered this so-called *Distoma hæmatobium* in the portal blood of an African monkey (*Cercopithecus fuliginosus*) six months before Diesing had

communicated his paper to the Vienna Academy, and, therefore, he hoped Dr. Harley (in concert with Weinland and others) would retain the generic name *Bilharzia*, which had the priority. At all events, this was not a new species of fluke, and, therefore, the name *Distoma capense* could not stand. But Dr. Harley's discovery was none the less important on this account. It was quite clear to him (Dr. Cobbold) that our fellow men at the Cape, in the Mauritius, on the banks of the Nile—and also, if you please, our friends, the monkeys—obtained this parasite by swallowing the "intermediate bearers" of the *Bilharzia*. These "bearers" or "hosts" were small mollusks or aquatic animals, inhabiting the African rivers. They contained the higher larval states of this parasite, the larvæ being introduced into the human body by drinking the African waters unfiltered.—*Med. Times and Gaz.*, Feb. 6, 1864.

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13. *Extensive Development of Cysticerci in the Human Body.*—Pierre Massot, aged 77, was admitted into the Hôtel-Dieu at Lyons in November, 1862, with pulmonary catarrh and general weakness. On February 9th, 1863, he broke the neck of the left thigh-bone, and was consequently removed into the surgical wards, under M. Delore, where he gradually became weaker, and died on April 16th. M. Delore had noticed, during the man's life, a number of small tumours on the chest, along the arms, on the elbows, and in the armpits. The lower limbs were very œdematous, so that the presence of any tumours in this situation could not be ascertained. The swellings were subcutaneous, and were not adherent to the skin nor to subjacent parts. Some of these seemed to be united by fibro-cellular bands, as they were easily moved together. The skin over them was unaltered; they were of the size of haricot-beans, very hard, and presented no trace of fluctuation. It was thought that they were of fibro-plastic character.

Thirty-hours after the man's death, the tumours were examined by MM. Delore and Bertholus, and were recognized to be due to the presence of cysticerci. Several cysticerci were found in the subcutaneous tissue of the conjunctivæ. The muscles were pale and easily torn; all those of the trunk and limbs contained numerous cysticerci; in the diaphragm there was one nearly as large as an almond. It was estimated that the subcutaneous conjunctival tissue and the subaponeurotic and intermuscular tissue contained about 2,000 of these bodies. They occupied principally the points of insertion of the muscles; their longest diameter lay parallel with the fibres, which they separated without destroying them; they were also lodged in the intermuscular spaces. No cysticerci were contained in the bones. The head of the thigh-bone was broken outside the capsule, and the great trochanter was also detached. Union had not taken place. There were no cysticerci in the eyes; nor at the base of the tongue, where they are always present in measly pigs (up to the present time, only one case of cysticerci in the human tongue has been noticed; it is related by Rudolphi). The liver, spleen, and kidneys were quite healthy; the latter presented numerous cysts on their surface. The pancreas contained one cysticercus. The mesentery was literally crammed with them. The parotid glands contained several. Three or four were found in the sides of the larynx. There were sixteen on the surface and in the tissue of the lungs. One was placed superficially on the anterior wall of the heart. The intestines were carefully washed and examined; but no tæniæ nor worms of any kind were found. In the nervous centres, 111 cysticerci were found; viz., 22 in the membranes, 84 in the cerebrum, 4 in the cerebellum, and 1 in the medulla oblongata. None were present in the spinal cord. On the surface of the brain, a rather large number of cysticerci had formed a small cavity in the substance of the convolutions; others were seen through a thin layer of cerebral substance. The ventricles, choroid plexus, and optic thalami, contained a considerable number. The brain was soft and diffluent.

An examination of the parasites showed that the vesicles varied much in size, and that they contained scolices having a double range of hooklets varying from thirty to thirty-four in number.

Very little information could be obtained as to the antecedent history of Pierre Massot. As far as could be ascertained, he was a beggar, led a wandering life, and was frequently intoxicated. His food ordinarily consisted of bread,

cheese, and pork. In the part of the country where he lived, measly pork is common; but no cases of tæniæ have been noticed there.

Cases where the muscles and organs have been generally occupied with cysticerci are very rare. M. Delore has met with only two such instances; one related by Werner, the other by Demarquay. In the latter case, most of the muscles contained cysticerci; but among the internal organs, the lungs alone. In a case of ununited fracture of the humerus, under the care of Dupuytren, where resection was performed, several hydatids were found in the fragments. The fracture was attributed to their presence, as the patient had broken his arm in throwing a stone with moderate force.—*British Medical Journal*, December 26, 1863, from *Gazette Méd. de Paris*, 3 Octobre, 1863.

14. *Epidemic Pleuro-Pneumonia in some Ships of the Mediterranean Fleet.*—Dr. BRYSON, Inspector-General of Hospitals and Fleets, R. N., read before the Epidemiological Society an account of this epidemic.

The disease was of a low, asthenic or typhoid type, accompanied with great congestion usually of the lower lobes of the lungs, and in many of the cases in the ship chiefly affected, the St. Jean d'Acre, with scorbutic symptoms, although the diet of the crew was in every respect as good as in the other vessels of the squadron. In the Cressy, too, there was an unusual prevalence of lung disease, often of an obscure and anomalous character, which was not easy to designate. The evidences of the pulmonary tissue being congested or even consolidated in different parts of the chest, associated with pleurisy or pleurodynia, and with such a cachectic condition of the system as might probably lead on to tubercular degeneration in chronic cases, were the most conspicuous features of the malady. Effusion into the chest was discovered in a few instances. Diarrhœal and dysenteric attacks were common both in the early and late stage. The following table shows how very differently different ships of the squadron were affected with diseases of the lungs in the course of the year, and also with other diseases, the extent of whose prevalence is usually regarded as a fair test of the healthiness, or otherwise, of a ship's crew. Attention should be paid to the number of the crew in each vessel, to estimate aright the marked difference in respect of the number of cases under each head in the different ships. The reader can easily calculate the ratio of attacks to the crew for himself:—

| | No. of Crew. | Cases of sickness in year. | Diseases of lungs, etc. | Diseases of bowels. | Fevers, continued and remittent. | Ulcers. |
|---|---|---|---|---|---|---|
| Marlborough . | 1145 | 937 | 129 | 64 | 10 | 75 |
| Agamemnon . | 840 | 881 | 241 | 58 | 17 | 30 |
| St. Jean d'Acre. | 815 | 1601 | 401 | 171 | 136 | 115 |
| Cressy . . | 720 | 1483 | 298 | 254 | 12 | 102 |

The deaths from disease in the St. Jean d'Acre, and in the Cressy were twice as numerous as in the Marlborough, notwithstanding the much smaller crews of the former vessels; and the number invalided from the first ship was fourfold as numerous. As to the chief cause of this enormous disproportion in the sickness and mortality, &c., in two ships of the same fleet and similarly exposed, it was clearly shown that this lay in the excessive overcrowding of the men at night in the St. Jean d'Acre on the lower deck, while in the Marlborough the men were more distributed on the different decks, and greater attention was paid to ventilation of the between decks. Only fourteen inches space was allowed to each hammock in the former ship; and so thoroughly was fresh, cool air excluded from the men while asleep, that the air above the hammocks was found to be from eight to ten degrees hotter than the air below the hammocks, and so offensively impure as to cause nausea to any one going down from the open air. With such a state of things, it is not wonderful that the health of the ship was so bad during the two years while on the station, that it was at last found necessary to send her to England to be paid off. Besides several features of resemblance in the symptoms of the pleuro-pneumonia in the St. Jean d'Acre and Cressy to the lung disease in cattle, it is to be noted that

there are good grounds for suspecting that the affection was communicated by the sick landed from the vessels to other patients in Malta Hospital.—*Med. Times and Gaz.*, Jan. 23, 1864.

15. *Pain in the Stomach following the Ingestion of Food, successfully treated by Manganese.*—Dr. Arthur Leared observes that pain caused by food is a very common functional affection of the stomach, and it affects women more frequently than men. Its ordinary position is at a spot just below the ensiform cartilage, but it may be localized at other points over the region of the stomach. At times it is diffused over a considerable space. When it has continued some time, and especially if its seat is the spot first mentioned, the affected part feels sore on pressure, and this soreness may remain after cessation of pain. In many cases pain extends a good way upwards beneath the sternum, more rarely it is diffused downwards towards the umbilicus, or even below it. It frequently extends towards the right in the track of the duodenum, and is sometimes experienced in the cardiac region itself. In many cases pain shoots from the part locally affected as from a focus, in various directions through the thorax, frequently to the upper part of the back.

The perception of pain by different individuals is variable, which partly accounts for the varying descriptions of the present affection. By some patients it is described as a dull continuous pain, by others as of a tearing, gnawing, or scraping nature, or like that which might be caused by a tight ligature.

The pain usually comes on from a quarter of an hour to an hour after a meal, but in severe cases is induced by taking even a few morsels of food. Its duration is uncertain, but it usually lasts some hours. There appears to be always a short interval between the time of swallowing the food and the occurrence of pain. A valuable means of diagnosis between it and the pain of ulcer of the stomach, in which pain generally happens immediately on swallowing solid food, is thus afforded. But the intensity of pain affords no measure of the gravity of the disease. The pain of cancer or of other organic diseases of the stomach may be less severe than that which is purely of a functional nature. Flatulence with a sense of distension are experienced in some cases, while in others they are entirely absent. Constipation is not a prominent feature of the disease.

The pain and tenderness are seldom connected with gastritis, as their transient nature, as well as the accompanying symptoms, sufficiently prove. They are simply an expression of exalted sensibility of the mucous membrane of the stomach, which becomes intolerant of the natural contact with the food, or else of the gastric juice itself. The facts that the pain does not come on until the food has been some time in the stomach, and that albuminous food—that which requires gastric juice for its reduction—causes suffering, while starchy aliments cause it in a less degree, or not at all, support the idea that the gastric juice is its source. I have been led by several circumstances to the belief, that the epithelial coating of the gastric mucous membrane is imperfect; that it is either shed too rapidly, or, owing to its imperfect growth, is inadequate for the protection of the delicate surface which it covers. Thus, the state of the tongue whose surface is continuous with that of the stomach, is generally very characteristic of the disease. Owing to a denudation of its epithelial covering, its extremity is very red, and its irritable-looking papillæ stand prominently out. The effect of treatment also proves that inflammation is not concerned in the disease.

I have thought it necessary to describe in some detail the nature of the disease before bringing forward a new remedy for it, because there are other painful conditions of the stomach which are not benefited by the same means. Its successful use will, therefore, greatly depend on accuracy of diagnosis. The gastric pain caused by gout, generally connected with an excess of acid is not removed by the same treatment; the pain which attends organic disease of the stomach is little influenced by it, and the same may be said of the neuralgic pain which is especially apt to occur when the stomach is empty.

In the treatment of the disorder before us, direct sedatives seldom give more than temporary relief. Opium has the great disadvantage of inducing constipation. Prussic acid, with or without alkalies, so useful in some kinds of stomach

pain, is generally futile. But the nitrate of bismuth has long been in deserved repute; more recently it has been almost superseded by its carbonate. These preparations are also open to the objection that they induce constipation. Both these substances are but sparingly soluble in the fluids of the stomach, and it occurred to me that their beneficial action may be exerted in a mechanical manner. It seemed possible that the diffusion of an inert powder over the walls of the empty stomach might, as it were, blunt the over-sensitiveness of its mucous membrane. With this view I tried, in several cases, the effects of silex prepared by precipitation from its solution, a perfectly inert and insoluble powder. The results were most encouraging. Passing then to substances which combine mechanical with a special action, I tried in many cases the saccharated carbonate of iron with little success. A fair trial of the magnetic oxide of iron yielded no better results. All the substances mentioned were given in doses of from x to xx grains. In pursuance of the same inquiries the black oxide of manganese, freed from impurities, at length came under trial. Here the results have been unexpectedly satisfactory. After having used it in several hundred cases, both in hospital and private practice, and after an experience of some years, I do not hesitate to pronounce it a most valuable addition to our stomach remedies. It is certainly more efficacious in allaying the hyperæsthetic state of the mucous membrane than bismuth. This has been proved by alternately exhibiting each remedy for a week at a time in severe cases, and carefully noting the results. But, independently of this, manganese has one cardinal advantage—it does not constipate. Assuming them equal in other respects, this alone is enough to stamp its superiority over bismuth, in the use of which we are constantly obliged to teaze the gastro-intestinal surface with irritating purgatives. Another advantage not to be overlooked, especially in hospital practice, is this—the purified oxide of manganese can be procured at one-sixth the price of the preparations of bismuth. I possess notes of a great number of cases treated by manganese which incontestably prove its efficacy. Space will not at present allow of these details, but the result of its trial in forty hospital out-patients, men and women, briefly stated, must suffice. The duration of the disease ranged from three weeks (the shortest) to several months and even years. The dose of the manganese was, in almost every instance, ten grains taken three times a day before meals. Alterations in diet could have had little influence in these cases.

After having taken manganese one week,

| | | |
|---|---|---|
| Pain was quite removed | in 12 | |
| Very much relieved | in 15 | 28 |
| Relieved | in 10 | |
| Unrelieved | in 3 | |
| | 40 | |

After having taken manganese two weeks.

| | | |
|---|---|---|
| Pain was quite removed | in 4 | |
| Very much relieved | in 15 | |
| Not so well as first week | in 1 | |
| Patients did not attend | | 8—28 |

Some of these patients continued taking the medicine for several weeks, and although a few who ceased to attend may possibly have remained unrelieved, no instance of failure came to my knowledge.

I was particular in ascertaining the effect on the bowels, and in four cases it is noted that the medicine was thought by the patients to constipate, in three of these only slightly. More extended observations, however, convince me that it has no constipating effect. In one case, on the other hand, it was stated to have purged.

Manganese is also highly useful in pyrosis, generally removing first the watery discharge and afterwards the pain in a short time. In certain irritable states of the stomach it is also of much service. In one remarkable case, in which a woman had been affected with vomiting for many months, after the failure of bismuth, manganese was very successful in quieting the stomach.

The purified oxide of manganese may be given in doses of from five grains to half a drachm, according to the severity of the case. I tried the carbonate of

manganese in a few cases with good results as regards pain, but in doses of ten grains it is apt to induce nausea, or even vomiting. The sulphate given in solution also allays pain, but I found that even five grains is still more liable to disagree with the stomach. The ordinary black oxide of manganese is very impure, and therefore unfit for use, The purified manganese may be obtained from Messrs. Garden & Robbins, 372 Oxford Street, W. I shall feel indebted to any gentleman who may make a trial of the remedy, for a report of the results. —*Dublin Med. Press*, Jan. 20, from *Med. Circular*.

16. *Tincture of Larch in Chronic Bronchial Affections.*—Dr. Headlam Greenhow calls attention (*Med. Times and Gaz.*, Feb. 20, 1864) to the fact that there is a certain stage of chronic bronchitis, in which expectorants cease to be useful. "More or less copious expectoration, indeed, still continues," he remarks, "but the acute symptoms have subsided, and the secretion from the bronchial membrane may be regarded rather in the light of a passive flux than as the immediate result of irritation. In such cases, the object of the physician must, therefore, be rather to check than to encourage the continuance of the expectoration. In patients who have suffered from repeated attacks of bronchitis, this stage of the disease often persists for a lengthened period, and may even ultimately become the habitual condition of the patient. A somewhat analogous condition of the bronchial membrane is frequently met with in cases in which there has been no previous attack of acute or subacute bronchitis, but in which the ailment, having begun with a slight increase of bronchial secretion, has gradually merged into a chronic cough attended by expectoration. This latter form of bronchial affection is especially apt to occur in patients of gouty constitution, and also in persons exposed to breathe either the overdried atmosphere of artificially-warmed and ill-ventilated apartments, or air charged with mechanical, gaseous, or other irritants. In whichever of these forms the chronic flux from the bronchial membrane may present itself, its tendency, even in slight cases, is to impair the general health and vigour of the patient, and to render him more especially liable to suffer from catarrhal attacks, each repetition of which further aggravates, and tends to render permanent the bronchial affection. Various remedies have been in use for the treatment of this class of cases, especially balsamic medicines—such as balsam copaiba, ammoniacum, and compound tincture of benzoin. Of these, balsam of copaiba is undoubtedly the most efficacious; but its nauseous taste and smell, for the most part, forbid its employment. Moreover, in many of such cases, there is a feeble condition of the digestive powers in which these balsamic medicines are apt to disagree with the stomach, and a want of general tone and vigour, requiring the administration of tonics. I have now, during some five or six years, been using, with much success, the tincture of larch in the treatment of these forms of bronchial affection. The tincture is made from the inner bark of the larch tree, and its taste is much less unpleasant than that of any of the above-named remedies. I have rarely found it disorder the stomach, and it is capable of being given in combination with tonics, or any other remedies the case may require. I most frequently prescribe it, in hospital practice, in doses of from twenty to thirty minims, in a mixture consisting of tincture of gentian, nitro-muriatic acid, and water, with or without ipecacuanha wine, and either tincture of hyoscyamus or compound tincture of camphor, according to the more or less frequency and severity of the cough. When desirable, the mixture may be rendered more agreeable to the taste by the substitution of syrup of orange peel for tincture of gentian. Of the value of the tincture of larch as a remedy in the large class of cases above described, I entertain no doubt, having tested its efficacy very carefully, and having repeatedly found that patients improved greatly under its use when other medicines had failed. I have in a few cases tried an extract of larch bark, but have found it less decidedly useful than the tincture, which is also the most convenient form for administration. It will be inferred from the tenor of the foregoing observations, that tincture of larch will be found useful only in chronic forms of bronchial disease, attended by considerable expectoration. Its employment is contraindicated in acute bronchitis, or during the intercurrent catarrhal attacks, to which patients suffer

ing from chronic bronchitis of long standing are so liable. Its effect as a remedy is gradually to lessen the amount of expectoration, and with it the cough and dyspnœa, and at the same time to render patients much less subject to catarrhal attacks at particular seasons or changes of weather."

17. *The Simultaneous Employment of Perchloride of Iron and Ergot of Rye in Albuminuria.*—Dr. SOCQUET, in the first instance, and afterwards Dr. CHATIN, both physicians of the Hôtel Dieu, of Lyons, have employed the perchloride of iron and ergot of rye for the prevention of the loss of albumen in the urine, and the results they have obtained are deserving of notice. The cases observed were some men of bad constitutions, weakened by former unfavourable hygienic conditions, such as unsufficient food, and dwelling in damp and badly-ventilated localities. The dropsy, in all the cases, at first confined to the face, had successively attacked the limbs and peritoneum. The urine was pale and inodorous, and contained large quantities of albumen, and in one case microscopic examination revealed the presence of the remains of renal epithelium. Immediately on their admission into the hospital these men were subjected to diaphoretics, alkaline diuretics, uva ursi, and digitalis, though without any good result; but at last they took the ergot of rye and perchloride of iron. These medicines were given in progressive doses, beginning with 20 drops of tincture of the perchloride and 50 centigrammes of ergot of rye. Every two or three days these doses were methodically increased, and carried successively to 30, 40, 50, 60, 70 drops of tincture of the perchloride, and to 75 centigrammes, 1 gramme (about 15 grains), and three grammes of the ergot. Under this treatment the albumen in the urine rapidly began to diminish; in ten days it disappeared completely, and in ten days afterwards the different dropsical effusions disappeared also. In one of the cases, the treatment having been suspended a little too soon, the albumen again appeared in the urine. In order to judge comparatively of the effects of the perchloride and the ergot, the perchloride was administered alone, when the albumen diminished; but this diminution, although rapid at first, was afterwards very slow. The ergot being added to the prescription accelerated the cure, and four days after its administration there was no more albumen in the urine. M. Perrond, in making some remarks on these cases, observes that the ergot and the perchloride of iron appear to have a beneficial effect on the albuminuria, but that their use constituted the treatment of a symptom rather than that of a disease, and that they are not therefore calculated to supersede the use of other measures intended to remove the original malady.—*Brit. and For. Med.-Chir. Rev.*, Jan. 1864.

18. *Treatment of Tendinous Rheumatism by the External Employment of Sulphur.*—Tendinous rheumatism, according to Dr. RENARD, differs from acute rheumatism by the absence of the general symptoms, and from the chronic by the presence of local inflammatory symptoms. Dr. Renard suffered from this complaint himself after an attack of acute rheumatism, for which he was copiously bled. The parts affected were the tendons of the hamstring muscles, and no improvement resulted after a long course of diaphoretics, camphor, terebinthinate, and other liniments, and the administration of the solanaceæ. At last Dr. Renard saw a passage in an English medical journal, stating that persons suffering from rheumatism in the legs had only to dust the inside of their stockings with sulphur. He immediately employed this simple remedy, the sulphur being the commercial flowers of brimstone, which contain some sulphurous acid. The curative effect was very well marked, for Dr. Renard walked in the evening, then renewed the sulphur in the stockings before sleeping in them, found himself very much relieved the next morning, and nearly quite cured on the morning after. A few days later, he left off the brimstone, and the pain reappeared in the soles of the feet, but yielded very soon to the reapplication of sulphur. Since the year 1857, when he was first attacked, the same experiment was repeated every winter when he was suffering from chronic tenodynia, either in the hams, the heels, or the elbows. He felt under the influence of the contact of the flowers of brimstone, the skin becoming hotter, slightly excited, and more disposed to sweating; and as soon as this effect was produced, the relief of the

pain seemed to be immediately marked. Whatever may be the explanation of the manner in which sulphur exerts its curative agency, Dr. Renard affirms that it has a beneficial effect upon the rheumatic pains of the tendons, and that this action is the more rapid and certain in proportion as the tendons are more superficial and the sulphur is kept more closely over the painful parts.—*B. & F. Med.-Chir. Rev.*, Jan. 1864, from *L' Union Médicale*, April 21, 1863.

19. *Male Fern in Tapeworm.*—Dr. Alexander Fleming gives the following as the result of his extensive therapeutical inquiries as to the usefulness or otherwise of the oil of male fern in tapeworm and the best mode of exhibiting the drug. These inquiries embrace 100 cases.

*Sex.* Of these 100 cases, 30 were males, and 70 females.

The remarkable preponderance of the female sex among the subjects of tapeworm, here shown, and, as I believe, for the first time on numerical data, is full of interest in relation to the cause of the disease, and most deserving of further inquiry. The great majority of the cases embraced in this report are taken from hospital out-patients, among whom the women suffer frequently from dyspepsia, very much more so than do the men; and we can readily understand how the "measle" will have a higher chance of escaping death in a weak stomach, and subsequently making a home for itself in the bowels. As respects the diet itself, the risk run by men must be greater than that by women; as they eat a larger proportion of animal food, and, in Birmingham especially, of pork.

Our returns show that the male-fern, as a remedy, is of equal efficacy in both sexes.

*Age.* The age of the patient is not mentioned in 8 of the cases. Of the remaining 92, the average age of all, in round numbers, is 29; of the females, 30; of the males, 28. The returns include cases of all ages except infancy, and prove that the oil of male-fern is an efficient remedy as well in the child as in the adult. A child of 1 year and 11 months is the youngest, and a woman aged 69 the oldest example. The exclusive milk diet of infants, and consequent freedom from the cause of the parasite, explains their immunity from tapeworm.

*The Duration of the Disease* is not given in 33 cases. Of the remaining 67, it is stated to vary from a few days, as in 4 cases in Dr. Anderson's schedule, to 36 years, as in the example reported by Mr. Anderton. There are 11 cases whose duration varies from 6 weeks to 10 months; 16 are reported of 1 year's duration; 9 of 2 years; 4 of 5 years; 3 of 7 years; 3 of 10 years; 1 of 12 years; 1 of 14 years; 2 of 20 years; and 1 of 36 years. The returns show that the oil of male-fern has been as efficient as a remedy in cases of long standing as in the more recent.

*Previous Treatment.* In 35 of the cases, it is stated that there was no previous treatment. Among the remedies which had been used in the others, kousso was employed twice—once with, and once without success. Turpentine had been given on fifteen occasions—seven times with, and eight times without success. The oil of male-fern had been previously used five times—three times with, and twice without success. In one of those cases where it had failed, it was subsequently given in mixture with milk, in the mode which I have suggested, and with perfect success.

*Dose, Time, and Mode of Administration. Dose.* The medicine has been administered in doses of a few minims, of half a drachm, of one drachm, one and a half, and of two drachms. The returns show that one drachm is a sufficient dose; at least, in the great majority of cases. The larger doses more frequently excite sickness, vomiting, and diarrhœa.

*Time.* In many of the cases, the oil was given in the morning; in a greater number, at bedtime. The results of the two methods, when compared together, do not show any material difference in success. I prefer to give the drug at bedtime, because the patient should continue to fast for eight or ten hours after taking it; and it is easier to do so during sleep than waking.

*Mode.* In 47 of the cases, the oil was given with milk, in the manner which I had myself suggested in the observations which accompanied the schedule. The following is the formula referred to.

"Mix well of oil of male-fern one drachm, and mucilage half an ounce. The

draught is mixed with one ounce and a half of sweet milk, and taken at bed-time; the patient having omitted the dinner and evening meal of that day. Taken thus, on an empty stomach, the mixture is carried speedily into the intestines, to feed, and at the same time poison, the hungry parasite which nestles there. Milk is the favourite food of the worm. Next morning, a dose of castor oil may be given. If necessary, this medication may be repeated daily, one, two, and three times, or until the worm is discharged."

In the remaining cases, the drug was given without milk, in mucilage or some aromatic water. In nearly all these cases comprised in the returns, care was taken to give the remedy on an empty stomach. The two classes of cases, therefore, or those in which the male-fern was given with milk, and those in which milk was not used, admit of a fair comparison; and of the higher efficiency of the first of these methods of exhibition the returns are conclusive. So given, the drug acts more quickly, and at the same time more efficiently. The proportion of failures is nearly the same with both methods; but the length of worm discharged, and, so far as we can judge, the thoroughness of the cure, predominate in those cases where milk was used.

*Physiological Effects.* Sometimes the medicine operates without pain or nausea; more often, there are sickness, griping pains, and purging. Vomiting is reported in ten of the cases. Dr. Bree observes that, under its use, the urine, was usually loaded with lithic acid. In one of Dr. Anderson's cases, the menses, which had been absent for several months, returned after the use of the oil. The vomiting and purging were caused frequently by the second dose, after the worm had been discharged; and must be ascribed to the action of the drug itself on the gastro-intestinal mucous membrane—not, as some have thought, to the dying struggles of the poisoned worm, though it may be that these play some part in their causation.

In five of the 100 cases, the worm was discharged alive. Except that it was expelled with unusual speed, I cannot trace any circumstance to account for the living state of the parasite in these examples.

The largest portion of tapeworm which is reported to have been passed is fifteen yards. This was in Dr. Bennett's case. No mention is made of any other species of tapeworm than the tænia solium. Large round worms were discharged in two cases.

The worm was for the most part expelled after the first dose, but in a few cases not till after the second or third dose. The worm was often passed before any purgative was taken, and separately from the ordinary evacuation. In one instance recorded in Mr. Thompson's schedule, the worm was discharged upwards by vomiting. This was the case of a female aged 40, who had suffered many years from tapeworm. She took one drachm of the oil of male-fern in milk, according to my formula; and, in the course of an hour, vomited a very long tapeworm, which was quite dead. None passed by stool. After two days, the draught was repeated; and she passed a large quantity of dead and broken tapeworm. The patient had previously taken various remedies without success. In Dr. Anderson's schedule, the case of a girl aged 18 is narrated, who became very sick after taking two drachms of the oil of male-fern in milk, and vomited a large round worm. She was afterwards purged smartly, and passed a quantity of joints of tapeworm.

The average time which elapsed between the administration of the oil and the expulsion of the parasite was six hours. It was discharged in half an hour in seven cases, in one hour in nine cases, in two hours in six cases, in three hours in three cases, in five hours in six cases. The longest interval mentioned is twenty-four hours.

In several of the cases, the worm was passed in a broken and softened state. In these cases, a considerable interval had elapsed between the taking of the oil and the expulsion of the worm, the softened condition of which was probably due to a more or less complete digestion of the already poisoned and dead worm.

The head is reported to have been found in three cases (schedule of Mr. Spender); but, in one of these, its discovery rests only on the authority of the patient. It is generally thought that the rarity with which the head is obtained is due to its not being killed and detached with the body; but it seems impro-

bable that the poison should take more effect on the body than the head of the creature, and which it meets first in its passage downwards from the stomach. According to Dr. Nelson, the food is taken in chiefly by the head. I am more inclined to refer the rare discovery of the head to its solution in the digestive fluids. Thin and delicate, it must be easy of digestion. Moreover, placed higher up in the canal, it is in closer proximity to the more active solvent juices. The thin and translucent neck, though found more often than the head, is also generally absent; and probably for the like reason. I am disposed to refer relapses to the growth of other worms, which have escaped the action of the poison, and not to the resprouting of the old head.

*Duration of the Cure.* Though relapses often occur, there is reason to believe that the cure is permanent in a large proportion of the cases. The length of time (one year) assigned to his inquiry, and the difficulty of ascertaining the future history, especially of hospital patients, render the returns in reference to this important point unavoidably of less value than we could desire. I may mention in this place, that Mr. Osborn in a note to his schedule, states that two cases of tapeworm are known to him, both females, of 38 and 17 years of age respectively, where the oil of male-fern was used with success, and where the patients remained, to his knowledge, well for many years.

In concluding this report, it is only just to remember, in connection with our subject, the early labours of Peschier of Geneva, and dating so far back as 1830, but which had been almost overlooked in England until Dr. Christison, in 1853, gave the sanction of his authority to the results of Peschier's trials. The later experiences of Drs. Gull, Jenner, Bennett, Willshire, Ransome, and others, have abundantly confirmed their observations, and, conjoined with the results of the present inquiry, establish beyond doubt the great efficacy of the oil of male-fern in tapeworm, and its superiority to the other known remedies of this disease. Further, our report points very decidedly to the most efficient mode of exhibiting the drug; and the whole inquiry has, as I have reason to know, rendered excellent service to therapeutics by making the virtues of the oil of male-fern more widely known and employed throught the profession.

It remains only for me to offer my best thanks to all the gentlemen who made returns to me for their valuable aid in this inquiry.—*British Med. Journal*, Jan. 16, 1864.

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20. *Diet in Diabetes.*—Dr. Edward Smith concludes some interesting observations on this subject with the following summary of the proper diet in diabetes.

1. *Fluids.*—To be limited by degrees daily until they shall not exceed five pounds and a half in both fluid and solid food. Of this quantity two to three pints should consist of new or skimmed milk, and one pint, or less, of tea. In the cold season and at night they should always be given when hot. Of all alcohols brandy is the best, and may be given with water only, or added to milk, or beat up with egg and milk, and given several times daily. No fluid should be given in greater quantity than half a pint at a time, and when milk is reduced in volume by cooking, the daily quantity of fluid must be made up by an additional supply of the same or other fluid.

2. *Solids.*—Dr. Prout's combination of eggs and milk (with sharps substituted for bran) is excellent. Four ounces of sharps and 4 oz. of peas, beans, or lentils may be made into bread or pudding, with milk, or into omelettes with eggs and herbs. Eggs and gelatin may be given when starchy food cannot be altogether intermitted. Eggs, gelatin, cheese, gluten, bread, meat, fat, and oils may be given as largely as they can be digested. The free use of salad oil should be urged, whether in the cooking of fish or flesh, or in the use of watercress as a salad or drunk alone, so that several ounces may, if possible, be consumed daily; but as there are in all persons preferences and dislikes in reference to particular fats, that kind—whether butter, suet, oil, or fat of meat—should be allowed which is the most agreeable. Four oz. of sharps, 3 oz. of wheaten flour, 5 oz. of peas, 1 lb. of meat, 2 oz. of cheese, 2 pints of milk, and 3 eggs, will afford more than about 13 oz. of carbon and 1 oz. of nitrogen daily.—*Lancet*, Feb. 6, 1864.

21. *Sudden Death from Obstruction of the Pulmonary Artery by Coagula.*—The following remarkable case of this is recorded in a recent number (Jan. 30, 1864) of the *Lancet*:—

"Mary A——, æt. 23, was admitted into St. George's Hospital on the 30th of September, 1863, with slight febrile symptoms. She was an hysterical but healthy girl. The symptoms rapidly subsided, and she became convalescent. She was about to leave the hospital recovered, when some stiffness and swelling of the left leg was observed, and she decided to remain a day or two longer. The same day the nurse was called to her at the water-closet, and found her in a fainting state, barely conscious. She died in a few minutes afterwards. An inquiry into her history showed that her previous health had been always good until five weeks before admission, when she had complained of pain in the chest. Ten days before she entered the hospital these symptoms had increased so far as to induce her to keep her bed, and she had several distinct rigors. The severity of the attacks must have subsided before admission, when the skin was cool and the tongue clean. She had quiet, rather frequent pulse, and the aspect of health. The patient had been treated at first with ammoniated salines, and afterwards was given valerian and aloes. Close questioning of her friends after death proved that she always enjoyed good health.

*Autopsy, sixteen hours after death.*—The body was plump and well nourished; a good deal of fat was present in the abdominal walls. The legs were slightly œdematous. The brain and its arteries were healthy. The left ventricle of the heart was quite uncontracted; the right was partly contracted. The pulmonary artery was entirely filled with partly decolorized clot, which was more or less adherent to its walls. This extended from the pulmonary valves to the bifurcation, and thence into both branches, and so on to the smallest branches which could be reached by dissection. In the lung, here and there a small ramification was found which was empty; but the right and left pulmonary artery, as well as the main trunk, were entirely obstructed. The fibrin was hard, and it had the appearance of having been formed for some time. The valves of the heart and the aorta to its end were natural, as also were the carotid and vertebral arteries. Lungs, bronchi, and pleuræ were healthy. The right leg was more obviously œdematous than the left, and its vessels were therefore examined. The deep femoral artery contained a partly bleached coagulum, which commenced with a point at the origin of the vessel, and filled it up as far as it could be followed. The femoral veins of the same limb also contained a clot, which began in a tapering form at the middle third of the thigh, and extended downwards to the ultimate ramifications of the vein. This was black in the centre, partly fibrinous at the edges. It was firm, and fully distended the vessel. Some slight adhesions held together the liver and spleen; these readily broke down, and allowed of the escape of a quantity of creamy matter, which was contained in a cavity between the liver and spleen, formed, however, chiefly at the expense of the latter. Under the microscope no true pus-cells were seen, but there were many nuclei and blood-corpuscles. It was believed that the apparent abscess was the result of the dissolution of a fibrinous block in the spleen. The vagina and cavity of the uterus contained pus.

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22. *Clinical Observations illustrating the effects of implication of the Pneumogastric Nerve in Aneurismal Tumours and Morbid Growths.*—This is the title of a paper read before the Royal Medical and Chirurgical Society (Jan. 26, 1864), by Dr. S. O. HABERSHON. After referring to the complex distribution of the pneumogastric nerve, and to the important symptoms of disease produced by the implication of its branches, the author proceeded to describe several cases of thoracic aneurism in which the branches of the recurrent laryngeal nerve, or the trunk of the pneumogastric, were involved. The first case was that of a man, aged 39, who had been engaged in laborious work at Chatham and Woolwich dockyards. Two months before death he began to suffer from hoarseness, and the laryngeal symptoms were more marked than any other. There were paroxysms of urgent dyspnœa and slight dysphagia. Five days before death hemorrhage from rupture into the trachea commenced; and on the morning of

his death the bleeding suddenly became profuse, and was quickly fatal. Dilatation of the aorta, double aneurism of the arterial innominata, and perforation into the trachea, were found. There was pressure upon the commencement of the recurrent nerve, and commencing degeneration of the muscular fibre of the laryngeal muscles on the same side. As to the physical signs, dulness and double bruit were produced immediately over the first bone of the sternum, but there was no bruit over the aortic valves. No pain had been complained of. The value of the laryngoscope had been shown in demonstrating that no disease of the larynx existed, slight œdema of the mucous membrane only being present. The second case was that of a sailor, aged 35, who had apoplexy, with aphonia and symptoms resembling phthisis; aneurism was, however, suspected. The recurrent and the pneumogastric nerves were both compressed: the muscles of the larynx were on one side pale and wasted, and the lung on the same side was in a state of asthenic pneumonia. The thoracic duct had also apparently been compressed. In the third instance recorded, the symptoms of cardiac disease obscured those of aneurism. There had been pericarditis and endocarditis, and fibroid degeneration of the muscular fibre of the left ventricle existed. The patient was a groom, aged 45, and two months before death symptoms of catarrh and bronchitis came on; the heart's action was irregular and tumultuous; the pulse very feeble, but without bruit. Afterwards a triple sound was produced below the nipple, and with renewed bronchitis there were signs of pleuro-pneumonia of the lower lobe of the right lung. No pain and no dysphagia were complained of, but paroxysms of urgent dyspnœa, with extreme faintness; in one of these attacks he died. In addition to the degeneration of the heart, an aneurism was found at the commencement of the transverse arch; and the pneumogastric, after giving off its recurrent branch, passed directly over the sac, and the compression of this nerve had determined the pneumonic consolidation of the lower lobe of the right lung. In the fourth case, the recurrent laryngeal nerve was compressed, and had produced paroxysms of urgent dyspnœa, but the dyspnœa was in great measure due to direct pressure upon the trachea. There had been feebleness of the voice, with dysphagia. Pain was of an agonizing character, but also paroxysmal, and it was apparently due to direct pressure on the nerves. The aneurism of the aorta was situated immediately beneath the subclavian, and had ultimately perforated the trachea; but rapid effusion of blood had been prevented by layers of fibrin, and it was probable that the first oozing of blood took place nine months before death. No bruit had been produced, but a ringing second sound; the heart was healthy. The author stated that pressure on the pneumogastric nerve and its branches by aneurismal tumours in the chest led, first, to paroxysmal and spasmodic contraction of the muscles of the larynx; secondly, to diminished muscular power, and to paralysis and wasting of the laryngeal muscles; and thirdly, to pulmonary congestion and consolidation; but that gastric symptoms, such as were found in peripheral pulmonary irritation of incipient phthisis, were not observed in thoracic aneurism. The effect of changed nervous supply of the œsophagus was briefly referred to; spasmodic contraction, and possibly also ulceration, taking place without direct pressure; the author stating that spasmodic contraction from this cause aggravated the effects of the direct pressure of tumours generally. It was likewise mentioned that occasionally no dysphagia existed, because the whole of the œsophagus opposed to the tumour was pushed aside *en masse*. In conclusion, the author detailed an instance of disease affecting the supra-renal capsule, with bronzed skin; and exhibited a drawing from his dissection of a branch of the pneumogastric to the capsule. The irritability of the stomach often present in these cases was referred to this connection. A dissection showing the larger branches of the semi-lunar ganglia, and the manner in which some of these branches were involved in the diseased capsules, was also exhibited.—*Med. Times and Gaz.*, Feb. 6, 1864.

## SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

23. *Statistics of Amputation performed at St. Bartholomew's Hospital, from the 1st of Jan., 1853, to the 1st of Oct., 1863.*—G. W. CALLENDER, Esq., read a communication on this subject before the Royal Med. and Chirurg. Soc., Feb. 9, 1864.

These amputations are so arranged in a series of tables as to show, for a number of consecutive years, the totals of deaths and of recoveries in male and female patients. The operations comprise all the principal amputations, arranged as primary and secondary, and as amputations for disease. After some general remarks, certain deductions from the several tables are detailed. Of 93 primary amputations, 78 recovered, and 15 died; thus 16.1 per cent. of all these amputations prove fatal, or 1 in 6.2; and if the age of the fatal cases, which averages 47 years, be taken into consideration, it appears, for children and for adults under 40, that an unfavourable result after these amputations is an exceptional occurrence. The secondary amputations number 37, and of these 24 recovered and 13 died; so that 35.1 per cent., or 1 in 2.8 of all these operations, prove fatal. Taking primary and secondary amputations together, 7.1 per cent. of those of the upper extremity, and 32.4 of those of the lower extremity, prove fatal; and 21.5 per cent., 1 in 46, of the total of traumatic amputations. There are 228 amputations for disease or for malformations: 182 recovered, and 46 died, or 20.1 per cent. Of those performed at the upper extremity, 18.5 per cent. died; whilst of those which involved the lower, 20.3 per cent. ended fatally. It follows that, of the total 358 amputations, the ratio of mortality are: after all primary amputations, 16.1 per cent.; after all secondary, 35.1; after all amputations for disease, 20.1; after all amputations at the upper extremity, 10.8; after all those at the lower, 23.6; and after all amputations, 20.6 per cent. *Causes of Death.*—Old people are little able to resist the shock of the more severe amputations, the influence of age being most marked with primary operations. Females do not rally so easily as males after the severe shocks which precede and accompany primary amputations, nor after the depression consequent upon amputation at the thigh. The rate of mortality on the totals of cases is 18.9 per cent. for males, and 21.6 per cent for females. The totals of deaths and of recoveries, as influenced by the age and sex of the patients, are shown in a separate table. After primary amputations, traumatic complications prove fatal at the rate of 40 per cent., and exhaustion at the rate of 20 per cent. of the total number of deaths. After secondary amputation, exhaustion is the chief cause of death, 38.4 per cent. sinking in this way; 23 per cent. die from secondary hemorrhage. Of the total of traumatic amputations ending fatally, 28.5 per cent. sink from exhaustion, 25 per cent. from traumatic complications, 21.4 per cent. from hemorrhage, and 7.1 per cent. from pyæmia. After amputations for disease ending fatally, exhaustion is the cause of death in 28.2 per cent.; pyæmia in 39.1 per cent.; and visceral complications in 15.2 per cent. Taking the four chief causes of death after all amputations, we obtain the following rates of mortality in the totals of fatal cases:—

| Amputations. | Hemorrhage. Per cent. | Pyæmia. Per cent. | Exhaustion. Per cent. | Visceral Complication Per cent. |
|---|---|---|---|---|
| Primary . . | 20.0 | — | 20.0 | 6.6 |
| Secondary . . | 23.0 | 15.3 | 38.4 | 15.3 |
| All traumatic . | 21.4 | 7.1 | 28.5 | 10.7 |
| For disease . . | 4.3 | 39.1 | 28.2 | 15.2 |

Of the total 74 fatal cases 24.3 per cent. die from exhaustion, 27 per cent. from pyæmia, 12.1 per cent. from hemorrhage, 16.1 per cent. from visceral complications. After giving the particulars of the cause of death in each fatal case, and the injury or the disease for which the operation was performed, the days in which 74 cases terminated fatally are shown in a tabular form. From this

it appears that deaths from shock, or from other injuries, or from both combined, take place within the first twenty-four hours, and within forty-eight hours the deaths from recurrent hemorrhage occur. Exhaustion is most fatal about the fourth day; secondary hemorrhage is a cause of death from the fifth to the twelfth day; pyæmia from the seventh to the twenty-fourth. Three cases of amputation are referred to, in which death was not accelerated by the operation, the patients dying on the 109th, the 102d, and 93d day respectively; and the paper concludes with an account of certain cases, and of certain sequences of fatal cases and recoveries, showing how necessary it is to mass together a considerable number of consecutive operations before we have a chance of arriving at tolerably just conclusions.

Mr. Bryant, after remarking on the value of Mr. Callender's paper, said that he was surprised to find some startling difference in the results he had obtained, and in those he (Mr. Bryant) had deduced from a similar kind of analysis of the cases at Guy's Hospital. As regards numbers, his and Mr. Callender's statistics were pretty much alike, but the rate of mortality was very different—in the former 20 per cent., in the latter 25; when, for injuries, the difference was greater still, the mortality at Guy's being nearly double. In amputation for disease, however, it was the reverse. Mr. Bryant asked if it were possible that a difference of practice at the two hospitals could reconcile these differences? At Guy's, conservative surgery was carried to an extreme degree, and possibly too far. Then, perhaps, at St. Bartholomew's the practice might run a little towards the other extreme. He spoke, however, on this subject with great diffidence. Mr. Bryant then alluded to the very marked difference in the mortality after amputation of the upper extremity, in his and in Mr. Callender's series. Mr. Bryant then asked for the simple results as regards amputation of the thigh for disease of the knee-joint, as he wished to compare the mortality of this operation and that of excision of the knee-joint. The mortality of the latter was about one in five; whilst at Guy's and St. George's that of amputation of the thigh was one in eight.

Mr. Callender said that the great discrepancy Mr. Bryant had alluded to, was accounted for by the difference in the ages of the patients in his own and in Mr. Bryant's series. Many of the traumatic cases were lads from printing offices in the neighbourhood, and the injuries were less severe than those from railway accidents. Then as regards the great mortality after amputation of the upper extremity, several of the cases were exceptional. Two died of erysipelas, and two were at death's door when the operation was done. He had not made an analysis as to the mortality from amputation above the knee, but would add a note on this point to his paper. In reference to the remarks by Mr. Spencer Wells, he said that, at St. Bartholomew's, great pains had been taken to improve the condition of the wards; and, moreover, a surgical registrar had been appointed, not merely to take notes of the cases of individual patients, but to watch the general health of the patients in the wards, to report upon any epidemics that might appear, and generally to supervise the hygienic arrangements, under the direction of the surgical staff.

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24. *New Method of arresting Venous Hemorrhage after Amputation.*—It is by no means uncommon for an annoying venous hemorrhage to take place after amputations, and though this may be often checked by elevating the stump or by pouring cold water over it, still these measures frequently are tardy in their effect and sometimes fail. Mr. Geo. H. Porter has proposed (*Dublin Quart. Journal Med. Sci.*, Nov. 1863) an ingenious plan for arresting the venous hemorrhage in these cases. He observes "that surgeons in this country are not favourable to the practice of ligaturing a vein, although having the sanction of such authorities as Hey, Desault, and Hennen. The dangerous, and sometimes fatal, phlebitis following such procedure, has given us a wholesome dread of tying, or, in any way inflicting injury on these vessels. Again, I should much fear that placing a ligature round both vein and artery—as, for example, the femoral vein and artery—(Desault) would prevent the cord having the desired effect on the latter, as the vein must hinder it from dividing the internal and middle coats of part of the tube, and thus render the possibility of secondary hemorrhage to be

apprehended. It occurred to me that the trouble might be got rid of by the simple contrivance of temporarily grasping the mouth of the vein within the jaws of a very small Dieffenbach's artery forceps, having connected with it a string to take it away when all bleeding had ceased. Its pressure effectually controls the flow of blood; its bulk forms no obstacle to bringing the parts into close approximation; and it can be removed with the greatest ease, almost, indeed, with the same facility that we draw away a ligature. At my request, my colleague, Mr. Collis, lately tested the plan with the most marked advantages, in a case of amputation of the thigh, in which bleeding from the femoral vein proved troublesome. My most sanguine expectations were realized by its action, as it instantly sealed the vessel, and so guarded against further hemorrhage and purulent absorption. It inflicted no injury; and, in the case above mentioned, it was pulled away in forty-eight hours without causing any pain to the patient."

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25. *Varicose Veins.*—Mr. SKEY remarked (*Lancet*, Jan. 2, 1864), that the treatment of varicose veins involves two objects: "1st, the increase of power to these organs; and 2d, the turning the current of the venous circulation into healthier channels. The first is effected by the liberal administration of nutrio-stimulants. The second object has tested the inventive faculties of many surgeons. I leave it to others to commend the various schemes adopted by them. I discountenance, from long observation of its incompetency to cure, the employment of the needle, whether through the vein or under it, single or double. It has these objections: 1st, it is not unattended with danger; and 2d, it fails to obliterate the vein, except at the point of its application, mainly because the applications cannot be safely made in numbers proportionate to that of the veins affected. I have at present in St. Bartholomew's Hospital a woman under treatment for varicose veins of the leg, whose limb was jeopardized by the employment of the needle a year ago. A long illness, with severe inflammation and extensive abscesses, followed. The same limb is again under treatment for the original disease. There is no danger in making any number of small eschars on the most projecting surfaces of varicose veins, if made with an escharotic composed of two-fifths of pure potash and three-fifths of powdered lime. This powder, well combined, is made into a paste with alcohol. Whether other escharotics are dangerous in their operation on veins I do not stop to inquire; I only know that the Vienna paste, combined as I have above described it, is not. These eschars may be made in any number proportionate to the extent of the disease. I have treated perhaps 250 cases in the course of the last ten years, and I continue to treat them, by the same means. The paste is applied over the most projecting parts of the vein in the following manner: through a series of about four layers of adhesive plaster a circle is cut of the size of a threepenny-piece or smaller. The influence of the escharotic extends through the vein; and it is curious to observe that from the hour of its application the entire vein appears to be obliterated, and is undetectable to the finger on pressure. From ten to twenty-five eschars may be applied between the ankle and the knee. Twenty minutes suffice for the full operation of the escharotic, and an average of one month for the cure. In very weak constitutions the ulcers will heal very slowly, unless well-directed efforts be made to give force to the general system."

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26. *Erectile Tumours of the Glans Penis.*—Dr. E. D. MAPOTHER reported to the Surgical Society of Ireland a case of this, and exhibited a drawing of it. The growth starts from left edge of the meatus urinarius, which it pushed into the form of a semicircular slit and projected outwards to about the size of a small hazel-nut. The tumour was not congenital, having been first perceived nine years before, when he was 26 years of age. It produced some pain, an uneasy stretching feeling at the urethral orifice, but not sufficiently annoying or constant to make him desirous of submitting to any operative procedure.

A somewhat similar growth has been observed about the orifice of the female urethra.

Mr. RICHARDSON exhibited at the same meeting of the society a drawing of a

congenital erectile tumour of the glans penis which came under his observation in a boy three years of age. The ulceration of the glans was far more extensive than in Dr. M.'s case.

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27. *Osteo-Aneurism.*—In our number for April, 1863, pp. 505–6, we noticed a very interesting case of this reported by Dr. MAPOTHER, and expressed the hope that the future history of the case would be made known, as the cure was too recent to decide as to its permanency.

At the meeting of the Surgical Society of Ireland on the 8th of January, 1864, Dr. P. reported that the patient when last heard from, in October, 1863, a year after the operation, was in the most perfect health.

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28. *Lithotrity without Injections.*—Mr. HENRY THOMPSON states (*Lancet*, Feb. 20th, 1864), that for some time past he has practised lithotrity—first without preliminary injection of the bladder, and secondly, almost without any injections subsequent to the setting; and he is satisfied that this mode of operating is a considerable improvement on the usual practice.

"My experience of the method," he says, "warrants me in speaking confidently. During the last three years I have, with the exception of a few patients only, always operated without the preliminary injection. In these some unusual condition has generally existed rendering injection desirable: this will be referred to presently.

"Hitherto all operators have agreed in recommending that the urine should be first withdrawn, and that from four to six ounces of warm water should be injected into the bladder before introducing the lithotrite for the purpose of crushing the stone. It has been assumed that the presence of at least that quantity is essential to protect the walls of the organ from injury when the lithotrite is opened and closed. And further, it has been considered desirable that the fluid should be present in *known* quantity. Hence lithotrity has often been regarded as inadmissible in a case where the bladder has been so irritable as to contain only an ounce or two of urine; and lithotomy, or a prolonged course of sedatives, baths, and injections, usually ending in disappointment, has been resorted to with the view of enabling the bladder to retain the orthodox 'four to six ounces.'

"I am quite sure that this quantity is unnecessary. Of late I have been content with two or three ounces, and, taking proper precautions, have crushed with the best results in an ounce of fluid. Neither does it appear necessary to know the exact quantity before commencing; for on first opening the lithotrite in the bladder, which the operator does very gently as, feeling his way, the amount of space available for his manipulations is at once manifest. Moreover, space in the bladder does not necessarily correspond with the presence of some fixed quantity of water therein. In some conditions of the bladder—or, to speak more accurately, perhaps, in some bladders—two or three ounces afford as good a working area as five or six ounces in others.

"It may be said—What is gained by the omission to inject? A very considerable advantage. It appeared to me very early in my experience of lithotrity, practised by others as well as myself, that most of the untoward occurrences met with arise either from too much or too rough manipulation, and that any step towards the improvement of the operation must for the most part be made by diminishing the amount of instrumental contact with the bladder and urethra. Hence, instead of introducing a catheter to draw off the patient's urine, and applying a syringe to inject a known quantity of water, I asked the patient to retain his urine for a little less than the accustomed period before the sitting; that is, if naturally he was able to retain his urine for about an hour, he was requested to pass it forty minutes before the time of the visit. The lithotrite was then at once introduced, and the crushing proceeded with. It is certainly undesirable to operate when the patient is urgently wishing to pass urine; hence it is as well to commence rather too soon than too long after the last act of micturition. In this manner the operator deals with a bladder not yet aroused to action, as it is sure to be when a catheter has been introduced, and when, moreover, the viscus has been unnaturally distended; for

however slowly and gently a syringeful of liquid is thrown into the bladder, such injection is more irritating than the oozing in of the natural secretion by the ureters. An entire "sitting," then, consists in introducing the lithotrite; in crushing the calculus five or six or a smaller number of times, for which two or three minutes is a sufficient period; and in withdrawing the instrument.

"Such may be regarded as the rule of practice. But when the bladder is much atonied, its coats being deficient in tone, and a large portion of urine remains behind after each act of micturition, it is mostly advantageous to empty the bladder, and inject a few ounces of cool water. The stimulus of water at 60° or 70° Fahr. sometimes gives tone for a time to the muscular coats, and so aids in producing a better formed cavity for operating in than a capacious atonied, and flaccid bladder presents.

"Next, in reference to injections made subsequently to the crushing of the stone, little or nothing appears to be gained by their employment. Three or four rapid injections through a large evacuating catheter generally cause more and are calculated to do more mischief, than the operation of crushing. Besides it is not the best time to make them in relation to the object of their application. If used at all, it should be after nature has been allowed a period of three or four days at least in which to expel the *débris*. It is a remarkable power that which the urinary apparatus possesses of expelling foreign bodies, not only from the cavity of the bladder, but from the innermost termination of the organs in the kidney, and it appears perhaps to be scarcely enough relied on by some operators. It is a most happy provision for the safety of the individual, and, after all, relieves humanity of an infinitely greater number of stones than the surgeon does. He only comes in to remedy the exceptional failures of Nature. I like to feel how efficient an ally there is for the lithotritist in this said power, and to leave the expulsion of the *débris*, when properly pulverized, very much to those admirably adjusted arrangements existing for the purpose; and my experience of their capability in this respect is considerable and satisfactory. Only, when it fails, we must, as before, step in to aid Nature again, and promptly.

"On referring to my case-book, I find, in relation to the first question, that I have crushed upwards of a hundred times without using a preliminary injection; and, in relation to the second question, that I have completed successfully eleven cases of lithotrity, most of them recent, without once using the evacuating sound. The *débris* have been easily and entirely expelled by the natural powers of the patient."

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29. *Subpubic Puncture of the Bladder.*—To avoid the danger of peritonitis, which sometimes follows the operation of puncturing the bladder above the pubes, M. VOILLEMIER has devised the following operation. The patient is placed on his back, with the legs slightly separated; the pelvis is raised by a thick cushion, so as to bring the pubes forward, and to prevent the distended bladder from embarrassing the operator. An assistant, standing at the left side of the patient, draws the penis downwards and backwards. Sitting at the patient's right side, the surgeon feels with his right fore-finger for the suspensory ligament, and with his left hand he introduces by the side of this ligament a trocar, curved so as to pass round the pubic bone. During this stage of the operation, the instrument is carefully supported and guided by the right hand, lest the trocar should turn too suddenly and come into contact with the bone. The canula having entered the bladder, the trocar is withdrawn. The operation was successfully performed by M. Voillemier, in the Hospital St. Louis, on October 14th. The cicatrization of the wound was complete in forty-eight hours; and, at the time of reporting, no trace of the operation remained, beyond a fibrous cord indicating the passage of the instrument.—*Brit. Med. Journ.*, Jan. 23, 1864, from *Gaz. Méd. de Paris*, 14 Nov. 1863.

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30. *Left Ovary in the Sac of an Oblique Inguinal Hernia, occurring in a Young Woman.*—Mr. HOLMES COOTE communicated the following example of this to the Royal Medical and Chirurgical Society (Jan. 12, 1864):—

A young woman was brought into St. Bartholomew's Hospital with a swelling in the left groin, and suffering from the symptoms of strangulated hernia. In

the course of a few hours the usual operation was performed, when the ovary and the Fallopian tube were found in the sac. A similar malposition of parts was subsequently noticed on the opposite side of the body. The left ovary was removed, some thickened omentum cut away, and the patient was put to bed; but the sickness and constipation continued, and she died four days after the operation. The cause of the sickness, etc., was displacement of the stomach and transverse arch of the colon. Mr. Coote raises two questions: 1. Was the displacement of the ovaries congenital, or the consequence of the hernia? He inclines to the former opinion. 2. The woman stated that she had always menstruated regularly. Now, on the examination of the body, it was found that both ovaries were well developed, and that the formation of the Graafian vesicles was going on naturally; but the Fallopian tubes were quite impervious, the uterus was completely absent, and the vagina was a short canal—an inch and a half in length, and terminating in a thin membrane. She said that she had been menstruating the week before her admission; and some of the female attendants at the hospital noticed the usual marks, though faint, upon her dress. Are we to admit the possibility of menstruation under this abnormal condition of parts?

Mr. Partridge said it was a very interesting question to decide whether menstruation occurred, as was stated, under such circumstances as obtained in Mr. Coote's case, or whether it was merely a vicarious action. There was another question of great importance in a moral point of view, which presented itself to surgeons in such cases. Were they justified in emasculating, as it were, a woman in whom the ovaries were thus involved? A case had lately come under his care in which a difficulty of this kind existed. The patient was a male child, with the parts of generation so imperfectly developed that it was mistaken for a female, and christened and educated as such. It was discussed whether the testicles should be removed. The surgeon in attendance thought that they should, as their removal would be advantageous to the child in assisting it to keep up its assumed sex. Mr. Partridge decided, however, that the operation was not justifiable, and it was not resorted to. Mr. Partridge then referred to two cases in which the uterus was absent; the one was an unmarried, the other a married woman. In each the vagina was short, but the clitoris, ovaries, and breasts were fully developed. In neither of these cases had there been any menstruation.

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31. *Polypus in the Urethra in Man.*—M. Beyran, having had under his care a case of urethral polypus in a man aged twenty-six, has collected the few recorded instances of this kind, and has communicated the results of his investigations in a memoir read before the Surgical Society of Paris. Urethral polypi, he finds, are most commonly seated at the commencement of the canal, in the navicular fossa; they may, however, occupy partly also the spongy portion, and sometimes even the entire length of the urethra. They are almost always met with on the lower part of the canal. The causes producing them are obscure. The ages of the patients have varied from fifteen to thirty years: but old age does not appear to be altogether exempt. The development of the tumours does not appear to be favoured by acute or chronic gonorrhœa, nor by syphilis; but M. Beyran thinks that chronic inflammation of the urethral mucous membrane, together with masturbation, are not altogether foreign to their production. The commencement of urethral polypi is not characterized by any remarkable symptoms; but as they increase in size and invade the urethral canal, one of the first morbid signs which attracts the patient's attention, is that the flow of urine is affected much in the same way as in ordinary stricture. This symptom is soon accompanied by heat, pain, and swelling of the penis during micturition; and blood is discharged, either pure or mixed with urine. Coitus is painful, and the discharge of semen is impeded. The bladder is incompletely emptied; there are frequent desire to pass urine, and tenesmus of the neck of the bladder and of the rectum, as in diseases of the prostate and bladder. Excrescences of this kind may, unless properly treated, produce perforation and fistula of the urethra. In the cases hitherto observed, urethral polypi in man have presented themselves in the form of small tumours varying in size

from a grain of barley to a pea. They have been fleshy, soft, and of a bright red colour; being very vascular, they have bled readily. Sometimes they have a broad base, sometimes are elongated or pedunculated. The urethra may contain several of them, seated in its inferior wall from the meatus to a distance of two-fifths or four-fifths of an inch from this orifice. The diagnosis is easy when the tumours project and can be seen; but while they are small, and especially if they be far back in the urethra, and the symptoms resemble those of stricture, mistakes are easily made. The diagnosis, however, may be essentially aided by observation of the phenomena produced during micturition, by the extreme readiness with which a discharge of blood is produced, and by a careful exploration of the urethra. The prognosis is not unfavourable, when the polypi are recognized early, and properly treated. But, left to themselves, they produce various accidents, and may even give rise to perforation of the canal. When the tumours are within reach, excision, followed by several applications of nitrate of silver, is preferable to avulsion or to ligature. Bougies, at first flexible and afterwards metallic, should be introduced, so as to repress any tendency to a reproduction of the polypi; and M. Beyran believes that it is useful to cover the bougie, before its introduction, with a layer of an ointment of calomel and savine. If perforation have occurred, the urine must be removed by a catheter, so as to allow the fistula to become healed.—*Gaz. Méd. de Paris*, 21 Nov., 1863.

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32. *Structure of Indurated Chancre of the Prepuce.*—In a paper read before the Biological Society of Paris, M. ORDONEZ has given the following summary of the appearances observed by him on making a histological examination of indurated chancre. 1. The epidermis is considerably thickened around the ulcerated part. The most superficial cells all present a central nucleus, tolerably large, with from one to four nucleoli; contrary to what is met with in healthy epidermis, where the cells lose their nuclei as they approach the external surface of the skin. 2. The interpapillary digitations in the true skin are larger at the level of the chancre than in the healthy skin. The epithelial cells are very closely packed, larger than in the normal state, and infiltrated by a very transparent fluid, coagulable by alcohol. 3. At the level of the papillary layer of the skin, small hemorrhagic clots may readily be detected, produced, no doubt, by the rupture of the small capillary loops distributed in the papillæ. Hæmatosine, mixed with red corpuscles in various stages of change, is effused in patches, between the papillary and the mucous layers. 4. The meshes of the cutis vera, from the papillary layer to its deepest portion, are infiltrated with a large quantity of plastic lymph. On merely making thin slices of the chancre, a large quantity of a very transparent, slightly viscid fluid, coagulating slowly on contact with the air, may be made to escape by pressure or by the action of the cutting instrument. This liquid, examined microscopically and with the aid of reagents, appears to be plastic lymph, or blastema. 5. The papillæ are increased in size, without being altered in shape. They are infiltrated with a large number of embryonic or transitory elements of the fibrous or connective tissue. These consist of round or oval nuclei, varying in diameter from .00016 to .00028 and .00036 of an inch; of small fusiform, fibro-plastic bodies in an ordinary state of evolution; and of small bundles of fibres of fibrous or connective tissue in progress of formation, and still presenting nuclei. 6. In the substance of the derma are to be found a number of fibrous cords, with perfectly developed fibres, and presenting a brilliant white aspect, contrasting remarkably with the adjacent tissue. This appearance is best presented by recent sections of the induration, examined by the aid of distilled water; it is also present, but less distinct, in specimens that have been preserved in alcohol or glycerine. M. Ordonez thinks that the alterations in the skin which he has described, satisfactorily explain the peculiar induration characteristic of the infecting chancre.—*Gazette Médicale de Paris*, 11 Octobre, 1863.

33. *A Specimen of Fracture of the Odontoid Process of the Axis, with perfect Anchylosis of its Apex with the Occipital Bone, and Partial Luxation Forward of the Atlas.*—Dr. Philip Bevan communicated this remarkable case to the Surgical Society of Ireland:—

This specimen was discovered accidentally whilst making a dissection of the ligaments of the spine. On opening the spinal canal, and removing the dura mater, the perpendicular ligament or apparatus ligamentus colli was normal in size and strength, but on removing it, the apex of the odontoid process of the axis was found to be connected by perfect bony union to the anterior margin of the foramen magnum of the occipital bone, whilst its neck was attached to the body of the bone by a fibrous substance, about three-quarters of an inch long, of great strength and thickness, which closely resembled that which ordinarily unites the fragments of a broken patella. On cutting into this substance, the transverse ligament was found of its usual strength and thickness, retaining its normal connection to the atlas on either side, but completely altered in its relations and position; for instead of passing behind the odontoid process, with a concave surface covered with cartilage and synovial membrane, directed towards that process, it now lay between the broken off point of the odontoid process and the body of the axis, with flat surfaces upwards and downwards. It still presented its usual glossy appearance when dissected from the fibrous tissue in which it was imbedded, and was fully as strong as in the natural state; but the smooth, articular surface and synovial membrane were removed from its anterior surface. Not a vestige of either the moderator or suspensory ligaments remained. Having dissected the anterior surface of the spine, the upper articular processes of the atlas retained the normal relations to the occipital condyles; but the lower ones were thrown forwards, considerably in front of their natural position on the dentata, and were supported there by a bony growth from the anterior margin of its articular processes; in fact, the atlas was partially luxated forwards, for want of the support of the odontoid process, and the axis was modelled so as to support that vertebra in its new position.

The anterior atlanto-axoidal ligament was very strong, and must have served to prevent further displacement of the atlas.

On examining the bones the following changes were found to have taken place: The occipital foramen magnum was completely changed in shape, being heart-shaped, instead of oval, owing to the attachment of the apex of the odontoid to the centre of its anterior margin.

Its transverse diameter is greater than the antero-posterior, the former being one inch and a quarter, whilst the latter is only 10–12th of an inch.

The most normal size is the reverse of the above.

The apex of the odontoid is so completely incorporated with the occipital bone, that, but for a slight crack on the right side, no appearance of the line of union would be perceptible; the base of it is *smooth as if cut* with a knife, where it was attached by a fibrous tissue to the body of the axis. The occipital condyle of the right side is unaltered, but that of the left side is changed in shape, axis, and direction, being flat, circular, and directed downwards and outwards; transversely larger than natural; about three-fourths of an inch in diameter; smooth and covered with cartilage on its surface, but rough and irregular round the margin. The inner surfaces of the condyles are quite smooth, instead of being rough, for the attachments of the moderator ligaments.

The upper articulating surfaces of the atlas are not much altered; the left one is more round than oval, and not contracted in the centre, as in the normal state. The lower articular processes, on the other hand, are much altered, being rough and irregular on the surface, surrounded by a bony growth, as in cases of chronic rheumatic arthritis, and much larger than natural, especially in the antero-posterior diameter; but the chief alteration has taken place in the anterior ring of the bone; it is contracted inferiorly by irregular growths from the lower articular processes. The posterior surface of the ring is prominent and rather rough (instead of being smooth and lined with cartilage and synovial membrane); it was here firmly united to the fibrous tissue, which united the apex to the base of the odontoid process. The lower surface of this ring is thick and broad,

where it lay on the upper surface of a process of bony growth from the anterior margin of the odontoid process.

The axis is also much altered; the body of the bone terminates above, in the base of the odontoid, from which the apex has been broken; from the front of this a bony mass has grown in a groove, on the top of which rested the anterior ring of the atlas, with which it was connected by the above-mentioned mass of fibro-cartilage; the upper articular processes are on different planes, the left being lower than the right. both of them are much enlarged by bony growth from their anterior margin, which overhangs the body of the bone to the extent of a quarter of an inch. This served as a support for the luxated articular processes of the atlas. The surfaces are rough and were covered by a very imperfect cartilage; the right is convex; the left concave.

The remains of the base of the odontoid is rough and very convex towards the vertebral canal; its upper surface is very irregular, being grooved transversely in front for the anterior ring of the atlas and behind for the attachment to the fibro-cartilage. It is much enlarged by the bony growths above described, being about two inches in circumference at the part corresponding to the neck of the process, and is so rough and irregular as to give it much the appearance of the bone represented in Mr. Adams' book, "on Rheumatic Arthritis."

I am not aware of any case similar to the above. Rokitansky says that, "in a few cases, fracture of the odontoid process has not only not proved fatal, but has existed for a considerable time without union of the fragments. A specimen of this kind is contained in the Vienna Museum."

He gives no particulars concerning it, says nothing of the state of the moderator ligaments, or whether the point of the odontoid was anchylosed to the occiput; nor does he mention the partial luxation of the atlas.

The specimen was taken from a woman aged about 40, who died of dysentery in one of the Dublin unions; all her bones were healthy and strong.

Although it is impossible to obtain a history of such a case, yet I had sufficient evidence that she never had anything remarkable about the motions of her neck; nor had she ever complained of pain or stiffness. Indeed, an examination of the preparation would prove that she must have had considerable power of moving the neck, as the fibrous tissue, which united the base and apex of the dentatus, although very strong, would permit a considerable amount of twisting, which with the ordinary circumduction of the remaining cervical vertebræ would be sufficient for all ordinary purposes, and the nodding motions could not have been interfered with.

It was, till lately, a generally received opinion that both luxations and fractures of the odontoid process were necessarily fatal. Thus Chelius says, "that if fractures occur with luxation above the third vertebra, death speedily ensues." Samuel Cooper says, "that whenever the processus dentatus is suddenly displaced or fractured, the effects on the medulla spinalis must be immediately fatal." Sir A. Cooper, Boyer, and Dupuytren, all declare that such cases are necessarily fatal. This opinion can no longer be admitted as regards fractures of the odontoid process, although I believe it is correct as regards luxations of that bone; for I cannot find any case of recovery where this process was proved by dissection to have been luxated without fracture. Two cases of supposed reduction of luxations of the axis are given in Malgaigne, but in both the diagnosis was very doubtful; in the first, the only important symptom was, that the head was bent forwards, so that the chin rested on the sternum. This might have been a luxation of any other cervical vertebra; and, in the second, although the constitutional symptoms were more important, and the head was thrown backwards and to the right side, still it was equally doubtful which vertebra was luxated, or indeed whether any vertebra was luxated. The interesting cases given by Dupuytren in his work "On Fractures," prove that it is extremely difficult to diagnose between severe contusions of the muscles and ligaments of the neck, and luxation of the cervical vertebra. In one of these cases the head rested on the left shoulder, could not be straightened, was accompanied with violent pain in the opposite side of the neck, numbness of the corresponding arm and cheek, difficulty of deglutition, and inability to turn the head without the body; in fact, all the symptoms of luxation were present, and a luxation

was supposed to exist; yet, in a few days, all these symptoms were removed by mere leeching and stuping. It is difficult to believe that a luxation of the odontoid process without fracture could occur without death supervening, if we recollect that either the transverse ligament must be broken, or the point of the process must pass under that ligament, which cannot occur without laceration of both the moderator and perpendicular ligaments, and that, in either case, the process must directly press upon the medulla oblongata, on the slightest motion of the head forwards.

But although luxations of the odontoid process must be fatal from pressure on the medulla, fractures of that process are by no means necessarily so. No doubt most of these must be fatal, either from the fearful shock to the system caused by such an amount of violence as is required to break that bone, or from the extravasation of blood on the medulla; but should the patient escape those dangers, there is no necessity for him to die of pressure of either of the fragments on the cord: in fact, the apex will be kept *in situ* by the moderator and transverse ligaments, whilst the base is retained by the powerful[1] apparatus ligamentosus colli. In experiments on this subject, having first cut across the odontoid process with a fine saw, without injuring the ligaments, in attempting to force the spine forcibly forwards, I found that the bones themselves gave way before any considerable amount of pressure was made on the medulla by the body of the axis, owing to the great strength of this ligament.

Malgaigne has collected three cases of this fracture of the odontoid with luxation of the atlas; in one, the patient lived seventeen days; in the second, he lived for one month and six days; and, in the third, he lived for four months.

Whilst a still more interesting case is given by Dr. Parker, of New York, where the patient walked about on the fifth day after the accident; on the ninth day resumed ordinary occupations; continued at his work notwithstanding constant pain in the head and neck, for five months, when he suddenly became paralyzed and died; yet the odontoid process was broken off, and its lower extremity was pressing on the cord at the time of his death.

This specimen proves, not only that a patient may live for months but for many years, as there can be little doubt that the accident happened in very early life. Indeed, that it occurred before the union of the epiphysis was consolidated to the body of the bone is rendered extremely probable, by the anchylosis of its apex to the occiput, as it is well known that the point of that process is the last part ossified, and would, therefore, be more likely to become adherent at that time than after the process of ossification had been completed. The alteration in the shape of the anterior ring of the atlas, and the smoothness of the surfaces of the occiptial condyles, where the moderator ligaments were attached, would lead to a similar conclusion.

In order to produce the accident, the neck must have been first violently twisted, so as to tear away the moderator ligaments, and then the neck must have been flexed backwards or forwards to break the odontoid process. The only practical deduction to be drawn from these cases is the necessity that perfect rest should be observed, and that a long time should elapse before a patient, who has received an obscure injury of the cervical region, should be permitted to support the weight of the head on the spine. Had Dr. Parker's case submitted to restraint, it is quite possible the broken bone might have united, and the patient lived as long as in the present case.—*Dublin Med. Press*, February 18, 1863.

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34. *Foreign Bodies in the Ear.*—Dr. Voltolini says that the first thing we have to do is to assure ourselves that a foreign body really is within the ear, for it by no means rarely happens that persons apply under the belief that an insect or other body is within the ear, which the most exact inspection fails to discover. In some cases, inflammation of the membrana tympani is the cause of the deceptive sensation, and this becomes aggravated by the unsuccessful

[1] This ligament is so strong that it has been divided into three layers by Dr. Humphrey in his excellent work "On the Bones."

searching for the foreign body. On the other hand, persons sometimes have foreign bodies in the ear without being the least aware of it. The author removed a rolled-up, hairy leaf from the bottom of the meatus, in the case of a lady, who had not the slightest idea how it came there, and who consulted him for deafness of the other ear. In another case, a hexangular glass bead was removed, the patient being entirely ignorant that she had any foreign body in the ear. We should always make a very careful examination, and, when possible, by aid of the direct rays of the sun. No artificial or reflected light is a substitute for this; but where it is not attainable, Dr. Voltolini employs an apparatus of his own invention, which is also serviceable in laryngoscopy. The simplest means of all, however, is to fasten a wax taper to the handle of a bright spoon in such a manner that the flame exactly reaches to the bowl of the spoon. Taking the spoon by its handle, and holding the light against the ear, by looking over it we are not dazzled, and can explore at our leisure. While in some cases the symptoms caused by foreign bodies in the ear are of a frightful intensity, in others they are wholly insignificant, and do not attract attention to the seat of mischief. For want of due examination of the ear, many patients complaining of giddiness, stupor, singing in the ears, &c., are sent to Carlsbad, Kissingen, or the sea-side, when all the mischief is due to a foreign body in the ear. Distant organs of the body may exhibit more or less considerable symptoms without, in some instances, the foreign body in the ear giving rise to any peculiar sensation, so that its presence remains unsuspected.

For the removal of foreign bodies we should first employ only the gentlest means, such as syringing the ear with warm water; and by this substances of the most different form and composition—even lead-pencil—may be removed. Beyond a bent forceps, an ear-scoop with a long handle, and a small corkscrew, almost all the instruments recommended for this purpose are more or less toys, or dangerous. By means of the corkscrew, wadding and similar soft substances may be easily drawn out; and in many cases we can remove bodies by passing the ear-scoop behind them. We should never employ force, and never should pass any instrument a line farther into the meatus than we can follow it with the eye. For want of such precaution, many a patient has lost his life or his hearing. The first effect of rough procedures is to make matters more obscure, the bleeding and swelling which ensue rendering complete inspection impossible. If the gentlest endeavours (or syringing), during which the eye guides the hand, do not succeed, the body should be left at rest in the ear—aye, even were it a dagger's point; and strong as the expression seems, the author justifies it by reference to cases on record in which pointed bodies have remained for years in the ear with impunity. It is not meant to be said that bodies should in general be left in the ear, but that matters should not be made worse than they are by violent manipulations. Leaving the body in the ear, then, warm-water syringing and soft poultices are to be daily resorted to, until the ensuing suppuration loosens it and gives it a new direction.—*Dublin Med. Press*, Jan. 27, 1864.

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## OPHTHALMOLOGY.

35. *Exophthalmos from Abscess in an Infant.*—Prof. ARLT related an interesting case of this to the Vienna Medical Society. A child, 15 days old, was brought to his Dispensary, who, otherwise quite well, presented a remarkably large exophthalmos. The eye was forced out about half an inch forwards, and nearly to the same extent outwards, the lids being distended and œdematous, and the conjunctiva, cornea, and iris remaining in a normal condition. The exophthalmos first commenced appearing on the tenth day after birth, and within five days had reached this enormous size. Dr. Arlt, believing that no other diseased process would explain this rapid protrusion, considered that abscess must be its cause, and made an exploratory puncture beneath the internal rectus. A little blood was the sole result; but next day the child's condition getting worse, and

a large prominence appearing at the inner angle, an incision half an inch deep was made by a small bistoury between the ball of the eye and the lower eyelid, with the effect of discharging a spoonful of thick pus, and allowing the eyeball to be replaced. Dr. Arlt believed the abscess proceeded from the ethmoid bone. Neither he nor Professor Pitha had ever met with exophthalmos from abscess in a child, although familiar with this case in the adult.—*Med. Times and Gaz.*, Oct. 10, 1863, from *Wien Wochenblatt*, 1862, No. 18.

36. *Corneal Incisions made with Scissors, and their Application to Extraction of Cataract.* By C. Bader, Ophthalmic Assistant-Surgeon to Guy's Hospital.—It occasionally happens even to the best operators for cataract that, on account of a sudden movement of the patient's eye or head, or of some other untoward accident, while passing the cataract knife across the anterior chamber, the corneal section cannot be completed, and the cataract knife has to be withdrawn, and the section to be finished in some other way.

The object of making the corneal incision with scissors was therefore—(1) to ascertain whether a better control could be obtained over the movements of the eye during the operation; (2) whether corneal incisions thus made would heal well; (3) whether this mode of operating is applicable to cataracts complicated with morbid changes of the vitreous, etc. Details of a few cases are given, in which the complications existing with cataract might have influenced the healing of the section.

*Mode of Operating.*—The position of the patient, of the assistant, and of the operator are the same as in ordinary extraction. The eyelids are kept open by a spring speculum. An opening is made into the cornea either with a broad needle or with a cataract knife at the spot which would be selected for ordinary extraction. The opening should be large enough to give easy access to one blade of a blunt-pointed pair of iris or strabismus scissors. The aqueous humour is allowed to escape slowly. Then one blade of the scissors is passed through the small corneal incision into the anterior chamber, taking care to glide its point along the posterior surface of the cornea, and carrying on the incision with the scissors. The incision is most easily made outwards, and downwards, and in the transparent margin of the cornea. Three or four successive small incisions will suffice to make the corneal wound equal in size to one made in the ordinary method of extraction, though it is quite in the power of the operator to make the incision as long or short as he pleases. The blades of the scissors while making the successive small incisions should not be closed completely, but only up to the blunt point, the latter resting upon the inner surface of the cornea, so that a good control is obtained over the movements of the eye, while the scissor-blade need not be introduced repeatedly into the anterior chamber. The left eye is operated upon with the left hand; the right with the right.

*Instruments required.*—1. A spring speculum. This speculum keeps the eyelids open without pressing upon the eyeball, *i. e.*, without stretching the conjunctiva so as to impede the movements of the eye; it is made of thin silver wire, to avoid its weight inconveniencing the eye, and it can, by a peculiar contrivance, be opened to a desired extent, and is found very useful wherever—as, for instance, in glaucoma—any undue pressure upon the eye during operation might prove injurious. 2. Forceps for fixing the eyeball, as suggested by Mr. France. 3. A pair of bent, blunt-pointed iris scissors. 4. A curette and scoop.

*Number of Cases.*—Twenty-one eyes were operated upon in this way; 9 times the left, 3 times both, and 6 times the right eye. In several cases ordinary extraction was performed on the fellow eye. 4 times an upper, 6 times a lower, and in the remainder of cases an outer and lower corneal incision was made.

*Ages of the Patients.*—Four between 20 and 50; 11 between 50 and 70; and 3 between 70 and 90.

Vision was improved in all cases, 18 of the 21 eyes being able to read small type. Vision was tested with the spectacles which were supplied to the patients. One patient (a short, stout woman) was attacked by gangrene of one leg on the fifth day after the operation, but the section of the cornea healed well, and normal vision was obtained.—*Med. Times and Gazette*, Oct. 24, 1863.

37. *Production of Lenticular Cataract by the use of Ergot of Rye.*—By Dr. IGNAZ MEIER, of Kronstadt. The consequences of the chronic intoxication by ergot of rye produced by the continued use of impure cereals (ergotismus convulsivus and gangränosus) are, as is well known, nervous diseases of various kinds, contractures, anæsthesia, and alterations of the sensitive organs. The author has observed that ergotism (raphania) is also the cause of cataract. In 1857 the disease prevailed in the southeastern part of Siebenbürgen, Austria, the uncommon wetness of the summer having produced a great frequency of ergotic rye. Two hundred and eighty-three individuals were attacked in six towns, ninety-eight of whom died. The symptoms of chronic intoxication were in the beginning gastric affections, loss of appetite, nausea, diarrhœa, or constipation, and after that a creeping sensation, and a kind of torpor of the limbs; finally cramps. Permanent contractions of the feet the author saw as the consequence of the latter. The pupils were generally dilated, the nails bluish, the skin yellowish or whitish, the temperature of the surface of the body low. The elimination of worms was not observed, nor the occurrence of abortion in pregnant women. The consecutive diseases were in those more seriously affected, typhus fever, vertigo, amblyopia, or even amaurosis, impairment of hearing, difficulty of speech, insanity or idiocy, epilepsy, periodic fits of laughter, and debility.

The inhabitants of the district live very poorly, and are much devoted to the abuse of alcohol. The majority of the patients were young. In one hundred and thirty-three cases the age was recorded, and it was found that twenty-five were from 1–10, thirty-one from 11–20, thirty-seven from 20–30, sixteen from 31–40, eleven from 41–50, nine from 51–60, four from 61–70 years. Death mostly occurred in younger individuals.

In the year following the epidemic the author was called on by a comparatively large number of individuals with cataract, and came to the conclusion, after careful inquiry, that cataract was frequently consecutive to ergotism. Of twenty-three persons affected, fifteen were females and eight males; three were from 10–20, seventeen from 20–30, and three from 50–60 years. The raphania had lasted in these cases from six weeks to three months. The prevailing symptom had been cramps. In fifteen cases, a headache, lasting for months, or even a year, and combined in some cases with vertigo and noises in the head, had followed the disease, and after it had subsided, or sometimes during its existence, the gradual loss of sight in one, and soon in the second eye, had taken place. The production of cataracts was always slow, and in all cases bilateral. The consistency of the diseased lens was found to be hard two, soft twelve, and semi-fluid nine times. Complications were not present; the optic nerve and retina seemed unaffected, and the operation had mostly a good result.

The author believes to have a right to assume that the cataracts were produced in consequence of the disturbances of nutrition of the crystalline body, caused by the chronic intoxication, or rather on the thereon depending changes in the nervous and vascular system. The symptoms produced by ergotine and the oil contained in the ergot of rye are, according to Professor Schroff (*Pharmacology*, Vienna, 1856, p. 548), nausea, dryness of the throat, loss of appetite, fulness, pain and stupor in the head, dilatation of the pupils, gastralgia, and enteralgia, and diminution in frequency of the pulse. It is rendered probable, the author states, in conclusion, by observations of a less recent date, that ergotine has a peculiar influence on the system of the ciliary nerves, and influences that way the nutrition of the lens, while on the other hand, the convulsive contractions of the eye-muscles, as they were frequently observed by the patients, may have caused a change in the nutrition of the lens, like the cataracts occurring after convulsions in young children.[?]—*Am. Journal of Ophthalmology.*

## MIDWIFERY.

38. *Effects of Secale Cornutum, administered 296 Times in 2000 Labours in Private Practice.*—Dr. JOHN W. BECK read the following paper before the Ulster Medical Society (Feb. 14, 1863):—

Having practised midwifery now for upwards of twenty-seven years, and having registered every case as it occurred for sixteen years and seven months of that period, I find that I have considerably above 2000 cases on my register. Case No. 1000 was delivered by me on the 3d day of August, 1855, and in these 1000 cases I have administered the secale 126 times. Case No. 2000 was delivered by me on the 16th day of July, 1862, less than seven years afterwards, and in this second 1000, I have administered the same drug 170 times; in all, 296 times in 2000 cases. Now, as I know positively that I administered the secale cornutum 296 times, in a practice extending over sixteen years and two months, I presume I was justified in assuming, as I did at our last meeting, that I had administered this agent "about 400 times" in a midwifery practice of upwards of twenty-seven years.

With regard to its effects on the mother—I have registered them in four degrees as follows: First, where it had apparently no effect at all. Second, where it had very little or very doubtful, if any effect. Third, where it had a decided effect, such as was expected and required. And lastly, where the effect was remarkably and perhaps unexpectedly rapid and energetic. Of the first, I find no effect in 15 cases; a very little or doubtful effect in 42; the good effects expected in 223; and an extraordinarily energetic action in 16 cases. Now, as these remarks were written down immediately after each case, I think they are much more to be depended on than any vague general impression, and the result appears very favourable to this drug when administered in appropriate cases.

I need not enter into the consideration of what constitutes an appropriate case for its use, but I may remark that it should never, under any circumstances, be given in the early stage of labour, before the os uteri is well opened, no matter what the pains may appear like. There are few things more annoying to the accoucheur than to be in attendance, for perhaps a day or two, on a patient who considers herself in labour, and who is continually urging him to do something for her; and moreover, bad as this is with a primipara, it is still worse and more embarrassing, when it occurs, as it sometimes will, with the mother of five or six children, who considers herself a judge of labour. In a case like this the os uteri may be little if at all dilated, and the process of dilatation may be so very slow as to be scarcely perceptible, although the pains may be very severe on the patient.

Now, in a case like this, secale should not be given (at this stage, at least), as it will be sure to disappoint you in any good effects you may expect from it, and this warning is the more necessary as it is just such a case as the young practitioner is tempted to give it in. I have given it under such circumstances myself several times, but never with any benefit or satisfaction; and this leads me to remark that perhaps the report of my register would not have been so favourable as it is had it contained a list of all the cases, "about 400," in which I administered it. I had the experience of about ten years of its use to guide me before I commenced this register; and this experience was valuable in enabling me to select the cases in which its use would be most appropriate; notwithstanding all this, however, I observe that in some of the cases where the effects are marked *nil*, the remark is made that it was administered *too soon*; so that I consider this a point worth insisting on. It seems to show that we do not always benefit as fully as we ought by our experience. On the other hand, however, I may remark, as illustrating the benefit of experience as a guide in the selection of cases proper for its administration, that of eight cases that were perforated in the 2000, in only three was secale tried; and these three occur early in the first 1000. I may observe, as a further illustration of the same thing, that the proportion of cases in which it was necessary to use the forceps

after the secale, diminishes as the register advances, averaging less in the second 1000 than in the first.

If, on the contrary, the labour be in an advanced stage, the parts soft, moist, and cool, and there exist no great mechanical obstruction to the advance of the fœtus—in short, in any case where it may be desirable to increase the muscular action of the uterus, either before *or after* paturition—its use is clearly indicated. But where the uterus has already acted energetically and failed to do its work, it is clearly inadmissible, as administering it in this case would be like the overdriving of a tired horse, and mischief must ensue.

For post-partum hemorrhage I again repeat there is no remedy equal to it. The more I have used it, the more dependence I am inclined to place in its use. I have given it 41 times after the birth of the fœtus for hemorrhage, retained placenta (*though I always proceed to remove it by the hand*), or a known lax state of the uterine tissues, tending to hemorrhage, and I find the effects marked good in all these 41 cases. In making this assertion I do not ignore position, pressure, temperature, &c., but my subject is at present the action of secale, and *not* uterine hemorrhage.

With regard to the effects of the secale cornutum *on the child*. I have long since come to the conclusion that it has no injurious effect on the child as a poison, and the registry seems to me to confirm this opinion in a remarkable manner. In every case, except one, where the child is marked dead-born, or as having died shortly after birth, there is a perfectly sufficient reason to account for death without the necessity of falling back on the secale, and in this one case, though I am not perfectly satisfied as to the cause of its death, I by no means feel inclined to attribute it to the secale. There were twenty children at the full term, who were either born dead, or died shortly after birth, after the administration of the secale. Of these, eleven were delivered by the forceps and three perforated. This, I presume, is sufficient to account for these fourteen deaths without blaming the secale. Of the remaining six, one was putrid when born, another had been turned, the third was a case of placenta prævia, and the child died from hemorrhage, the fourth child was born with a rigid state of the voluntary muscles, and a kind of *rigid* catalepsy, but more like rigor mortis than anything else. The abdomen was enormously distended and tympanitic; it lived an hour, dying out quietly. The fifth child was very large, and the labour was very slow, consequently the pressure was very great and long continued. Twenty-six hours' severe pressure during labour is enough to account for the death of this child. It might have been saved by the forceps, but as a rule I don't use them while the child is making an advance at all. The sixth child, though born after a labour of thirty-five hours, still seemed to me, I must admit, unlike the previous one, to have suffered no pressure sufficient to produce its death. It lived, at least the heart beat, for half an hour, but all the means I could use were unsuccessful in producing even an attempt at respiration, still I am not inclined to attribute this death to any poisonous effect of the secale, as I have seen two children besides die out in a very similar manner where no secale had been used.

I shall now address myself to a question which has been raised here as to the connection there may be between a lax state of the uterine tissues as promoting or facilitating the absorption of putrid matter through the uterus and the production of puerperal fever; in other words, how far the administration of secale may, by promoting the contraction of the uterus, prevent the absorption of its putrid contents, on the absorption of which puerperal fever may be supposed to depend.

There are four deaths of mothers in these 296 cases. The first death occurred in a primipara, aged about 40 years, who was delivered by the forceps of a very large and extremely putrid child. She complained of nothing but prostration, gradually sank into a state of coma, and died in four days. I have no doubt this death was from putrid infection. How far the secale tended to prevent its occurrence I can't say. It is marked as having produced very little, if any, effect. The second death was from hemorrhage. It was a case of placenta prævia. I was called by a member of this Society to turn. I did so. She died on the twenty-seventh day after delivery. The third death was that of a patient with

inflammation of the bowels, who was delivered of a four months' fœtus after eleven days' constipation, and died the next day from exhaustion. The fourth death was a primipara, delivered with great difficulty after a twenty hours' labour. The effect of the secale is marked "very good;" but I had evidently despaired of her being able to deliver herself, as the child was born while a messenger was away for the forceps. She died thirteen days afterwards of what is marked "putrid fever." These are all the cases of death, or puerperal fever, that occurred among the cases where secale was given. Whether the evidence educed from them may be *pro* or *con* I don't know, but you may take it *quantum valeat*.

There is just another point I would say a word or two on before concluding, and that is, the proper method of preserving and administering the secale itself. It is a drug the active properties of which are very easily destroyed by damp. It is also very liable to be attacked by an acarus or mite, particularly when damp. It should be procured in substance whole. I have no faith in its powder, or tincture, or extract, or anything else, but itself. After it is procured, it should be carefully dried, and put into a well-stoppered bottle, with a small piece of camphor. If this is done it will keep sound and active for a long time. The camphor seems to have the effect of preserving it from the attacks of the acarus. Again, a new parcel of the drug should never be placed in the bottle along with the old. What remains of the old stock should be taken out, the bottle well washed and dried, and your new lot, well dried over a stove, if possible, placed in it on the top of a little bit of camphor. I believe that it is from neglecting to preserve this valuable drug properly, or from prescribing some of its *fancy* preparations, that it so often disappoints the expectations of some practitioners as to cause them to lose faith in it. I have no hesitation in saying that if you can procure a sound lot of this drug, and preserve it in the way I have directed, you will be very seldom disappointed in its action if administered in the following manner, and I again repeat, *only in appropriate* cases. I know that latterly when it failed in my hands even once, and particularly if twice in succession, I was inclined to look for the cause in the bottle, and more than once found it then in the bad quality of the drug.

The way I administer the drug is as follows: I take two drachms, always fresh powdered as required, and boil it in eight or ten ounces of water for about five minutes. I administer this in three or four doses, *as hot as it can be swallowed*, with from twenty minutes to half an hour between each dose. Generally two or three doses are sufficient to produce all the effects required, sometimes one dose will do. If the first or second dose produces little or no effect, you will generally find the third or fourth will produce as little, and I don't believe it is even useful or necessary to go beyond this two-drachm dose, even when the first or second dose is thrown off, as it sometimes is. When it is thrown off, it is not because it is an emetic in the ordinary sense of that word, though it has been called one. It excites the uterine action, and this action (or rather the stretching of the os uteri caused by this action) excites or produces the emetic effects on the stomach, precisely as occurs in cases when no secale has been given. Some one relates the case of a married woman who always vomited while in coitu, and I had a patient myself whom I could make retch at pleasure by touching the os uteri with the tip of the finger, although she could give no explanation herself as to the cause of the retching, or as to why she retched, yet the result of the touch was invariable. I made the discovery accidentally while examining her by the *tactus eruditus*. I had an opportunity of ascertaining some year or two afterwards that the os uteri had lost this peculiar irritability. —*Dublin Med. Press*, June 17, 1863.

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39. *Treatment of the Vomiting of Pregnancy.*—Prof. Gustav Braun, of Vienna, remarks that "the treatment of the vomiting of pregnancy is not always crowned with satisfactory results, as indeed the long list of the most various remedies recommended sufficiently proves. The heightened sensitiveness of the stomach renders necessary easily digestible food, such as cold roast poultry, venison, and underdone beef. Good results are generally obtained from the use of seltzer and other aërated waters, and mild or even drastic purgatives; but

the best effect is to be expected from bitter, tonic, antispasmodic remedies. Among these may be mentioned calamus, tincture of ipecacuanha, orange flower water, and assafœtida. Among drinks may be mentioned good old wines, champagne and coffee. Less favourable results are to be expected from opium, morphia, and castoreum. Hohl recommends, when the vomiting depends upon increased secretion of bile, and this is not occasioned by pressure on the liver, the use of bicarbonate of soda and tincture of nux vomica. Where there is inflammatory irritation of the cervix, Negrier thinks good is done by the application of leeches to the vaginal portion; and Bretonneau endeavoured to overcome spasmodic rigidity of the uterus by the application of belladonna ointment. Moriceau thought benefit was derived from the application of a large derivatory to the region of the stomach. Simpson speedily cured a severe case by inhalation of opium. Krause recommends that some lukewarm gruel or very weak green tea should be always kept in readiness, and that some cups of it should be taken quickly in order to provide material for the speedy evacuation of the stomach; he also found creasote combined with steel act very efficaciously.

Ferrand had a satisfactory result in a case of obstinate vomiting, where he employed moxas, and in another where he applied Vienna paste; in the second case, however, chloroform and iodine were also employed. In cases of the kind under consideration, Corvisart, Baudot, Gentles, and others recommend pepsine. They give ten grains of it once a day, or a teaspoonful of the liquor pepticus thrice daily, immediately before meals. Henoch recommends, when vomiting during pregnancy is very obstinate, the use of creasote. In three cases where other means had proved useless, he obtained a cure by means of it; in one case the vomiting ceased after the first dose, in another it was not checked for a month.

From the fear that from the continual vomiting a fatal result might occur, it has been proposed that abortion or premature labour should be artificially induced. Opinions are not unanimous as to the propriety of this proceeding. Cazeaux is opposed to it, because no special time can be fixed when the abortion should be brought about. Villeneuve is in favour of the induction of abortion when the life of the mother or child is seriously endangered. Busch considers abortion admissible in none but extreme cases. Hohl objects to the induction of abortion, because the most severe cases of vomiting very seldom end fatally. Churchill and Lee have by this means obtained very satisfactory results. C. Braun trusts to the expectant method, and recommends abortion only in cases where the life of the mother is seriously endangered.

In the few cases where vomiting depends upon retroversion of the pregnant uterus, it may, though having previously resisted all treatment, be speedily and permanently cured by replacing the womb in its normal position. This is proved by one of my cases, where obstinate vomiting accompanied anteflexion of the pregnant uterus. The observation is so much the more interesting, as no case similar to it has been published. The subject was a woman, twenty-two years of age, of healthy parents, who had menstruated for the first time in her sixteenth year, and in whom menstruation had always observed the normal type. In December, 1862, menstruation ceased, and during this month the patient was in the enjoyment of perfect health. On the 1st of January, 1863, vomiting occurred, which ceased on the following day, but returned a few days afterwards, until, finally, on the 13th of March, it was so violent that she was induced to apply for medical advice. On her admission the patient was found to be of the middle height, her osseous system was slender, and her muscular development proportional. The body was emaciated, the surface of a yellowish-white colour. The breasts, over which the skin was moderately stretched, were firm; the nipples irregular and surrounded by an olive-coloured areola. There were no head symptoms; the thorax was long, of moderate breadth, and well arched; inspiration and expiration were natural. The sounds on auscultation and percussion of the chest were normal; on palpation the lower part of the belly was found distended, and above the symphysis pubis an indeterminately limited tumour was recognized, which could not be closely examined in consequence of the tension of the abdominal walls, but over which percussion was dull. On vaginal examination the opening of the vagina was found moderately

wide, the temperature of the canal was higher than natural, and the secretion from its mucous membrane increased. Through the anterior vaginal wall pressed a round firm tumour, which was movable with difficulty, and behind was continued in the vaginal portion, bent at an angle and directed towards the point of the coccyx. There was constipation, and the patient vomited ten or fifteen times daily, especially when fasting, a greenish mucus in no great quantity; there was no nausea, and the matter was discharged suddenly, as if by eructations. The pulse was normal; the patient only complained of occasional dizziness which lasted for one or two minutes, and which came on when she sat up in bed.

An absence of the other symptoms which accompany those diseases, of which vomiting is a symptom, such as acute or chronic gastric catarrh, perforating ulcer, carcinoma of the stomach, paratyphlitis, rendered the diagnosis easy, and the vomiting was accordingly referred to the flexed condition of the pregnant uterus.

Although it was probable, but not certain, that there was an absence of adhesions of the fundus to the posterior wall of the bladder, the prognosis was only doubtful, as when the uterus is replaced it too often again falls over; the prognosis regarding the cessation of the vomiting was dependent upon the greater or less facility of the reposition of the flexed uterus and its retention in its normal situation.

I therefore determined to endeavour to replace the flexed uterus. With this view the urinary bladder was emptied by means of an elastic catheter, and the rectum was cleared out, and as the patient's susceptibility was very inconsiderable, I decided to attempt the replacement of the organ without the help of chloroform. Two pillows were now introduced below the sacrum so as to elevate the pelvic region. The index and middle fingers of the left hand were introduced into the vagina, and pressure was made forwards and upwards. The fundus of the uterus immediately passed upwards, and could be clearly felt through the abdominal parietes. In order to prevent the uterus from falling backwards, the patient was directed to lie upon her face, a position which she kept pretty continuously for several days. The result was most satisfactory. The vomiting, which had occurred six times in the morning of the day when the replacement of the uterus was effected, at once ceased. The patient stated that she experienced instantaneous relief when the replacement of the uterus was effected, and under a nourishing diet she made a rapid and perfect recovery."—*Ed. Med. Journ.*, Feb. 1864, from *Wochenblatt der Zeitschrift der k. k. Gesel. der Aerzte in Wien*, Nos. 47 and 48, 1863.

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## HYGIENE.

40. *Practicability of Arresting the Development of Epidemic Diseases by the Use of Anti-zymotic Agents.*—Dr. Robinson read a paper on this subject before one of the sections of the British Association for the Advancement of Science, at its meeting at New Castle.

The author commenced by referring to the circumstance of the analogy between many of the phenomena of fevers and other zymotic diseases, and the ordinary process of fermentation having been perceived and recognized by Hippocrates and the oldest writers on medicine. Their idea was that a poisonous ferment, existing in the atmosphere, entered the mass of blood and induced in it a series of changes, which gave rise to the excessive heat, and other peculiarities of that class of diseases—at the present time, this doctrine, modified by the discoveries of Liebig and other chemists, has been adopted by most physicians, and forms the basis of the classification of disease framed by Dr. Farr, and used by the Registrar-General. It thus supposes living germs to exist in the atmosphere, which, when introduced into the body, give rise to a specific and regular series of morbid actions, pursuing a definite course in a definite time, as in

smallpox—those germs being disclosed and multiplied, and producing others capable of reproducing in other bodies the same succession of changes—other lethologists have supposed that the atmospheric poison acts on the blood chemically, by giving rise to what may be termed catalytic actions—while the author is disposed to believe, from what he saw during the cholera epidemic in Newcastle in 1853, that some of these volatile organic matters in the atmosphere are capable of acting on the human body as direct poisons, and that this inanimate volatile poisonous matter also furnishes nutrition to the organic germs suspended in the air. After these preliminary remarks he proceeded to refer briefly to a number of scattered facts, which seemed to him to indicate the existence of a great principle, which might hereafter be found applicable to the prevention or mitigation of epidemic diseases by the direct use of substances capable of arresting the process of morbific fermentation. He mentioned the following facts as converging to this conclusion: 1. Antiseptic substances, ranging from simple innocuous matters, such as sugar, up to the powerful metallic poisons, such as corrosive sublimate, and forming a very numerous and diversified group, have long been known to be capable of arresting the putrefraction of animal and vegetable structures. 2. The same substances prevent the formation of fungi, as is seen in the use of solutions of metallic salts in the taxidermy in the prevention of dry rot, &c. 3. Many of those agents are also known to arrest at once the process of fermentation, as, for instance, sulphurous acid, and Emi and other chemists have observed under the microscope the rapid stoppage of the vitality of the yeast plant when a solution of arsenious acid was added to the fermenting liquor. 4. The formation of the fungus in and on the plant, which causes the vine disease, is prevented by applying sulphur to the affected vines. 5. In Cornwall it is believed that the arsenical fumes from the tin-calcining furnaces exercised an influence over the potato-plants in the neighbourhood, which preserved them from the disease then affecting other parts of the same county. [A statement to this effect, signed by Captain Charles Thomas, Sen., of Dolwath, and sixteen cottagers, was here read.] 6. It has been found that when a species of fermentation has taken place in the human stomach resulting in the development in large quantities of a minute organism (the sarcina ventriculi), this morbid action can be controlled and stopped by the direct anti-zymotic influence of certain salts, such as sulphate of soda, in doses perfectly compatible with the patient's safety. 7. In different parts of the world, among different races, a belief has long existed that certain antiseptic substances, of which arsenic may be taken as the type, are capable of acting as antidotes or preservative and curative agencies against atmospheric and other poisons, and in some cases that popular belief has proved to be well-founded. The experience of the multitude discovered the value of arsenic as a cure for ague long before it was recognized as such by physicians. The arsenical fumes of certain works in Cornwall were stated by the late Dr. Paris to have stopped the ague, previously endemic there. More recently it has been stated that the arsenic eaters of Styria are peculiarly exempt from fevers and other epidemic diseases. And in India the natives have long used arsenic as an antidote for the poison of snakes. Dr. Robinson concluded by expressing a belief that these scattered observations were not only sufficient to justify and necessitate further inquiries in this direction, but seemed in themselves to shadow forth the outline of a great law which might at some future time be productive of immense benefit to mankind.—*Med. Times and Gaz.*, Sept. 26, 1863.

41. *Iodine as a Deodorizer and Disinfectant.*—Dr. B. W. RICHARDSON, at one of the recent meetings of the British Association for the Advancement of Science, at New Castle, made some remarks on this subject. He said: The iodine should be placed in a common chip-box, such as is employed by pharmaceutists, the lid of the box being replaced by a covering of "leno," or the iodine may be placed in the ornamental vases on the mantle-shelf of a room. The smell of iodine could thus be communicated to the air of an apartment, and air so purified was not only fresh and agreeable to the sense of smell, but any organic matters present in it were destroyed. In extreme cases the iodine should be placed on a dish or plate, and the heat of a candle being applied beneath,

the iodine was volatilized, and a room was quickly purified. Dr. Richardson said that in cases of smallpox a knowledge of the facts he had named was most valuable. In rooms occupied by sufferers from this painful disease, organic matters floated largely in the air, rendering the air most offensive. He (Dr. Richardson) had succeeded, in all cases, in rendering such air inodorous by the volatilization of iodine. He had also observed the singular fact that when the air was greatly charged with organic materials, the smell of the iodine was for a long time imperceptible, so that, in truth, the iodine method of purification was also a ready and practical test of the purity of an air. Dr. Richardson thought the iodine plan was quite as effective as the liberation of free ozone—it was, indeed, in principle the same, and was so simple that every person could employ it.—*Med. Times and Gaz.*, Sept. 26, 1863.

42. *Effects of Surat Cotton on the Health of Operatives in Mills.*—Mr. Jesse Leach, of Lancashire, makes (*Lancet*, Dec. 5, 1863) the following interesting observations on this subject, which are well worth the attention of proprietors of cotton factories in this country.

"When viewing a sunbeam in the comparatively still atmosphere of a room, the air is seen filled with dust and short textile fibres. Placed in the same situation while the room floor is being swept, the sunbeam appears completely glutted with larger quantities of the same floating materials, causing an oppression of the chest and disposition to sneeze. What is manifestly revealed to us through the medium of a sunbeam in a private room more forcibly applies to the rooms of a cotton mill, where the short fibres and dirt of the staple material are effectually separated by the teeth of machinery revolving at a rapid speed.

"It is necessary to say a few words on the cotton staple to correctly estimate the amount of dust in different samples of cotton. Whatever name it bears, much loss is sustained during the processes of manufacture: the American the least; the East Indian or Surat the most. Twenty-five per cent. is an average loss during the manufacture of Surat. The greater amount of loss sustained the more damaging to the constitutions of the operatives employed. The higher the rooms of a mill and the better their ventilation, the more harmless to the health of the workers; the lower the rooms of a mill and the more imperfect their ventilation, the greater the amount and extent of bodily sufferings of the mill operatives. The following remarks more particularly apply to operatives working in low, narrow, ill-ventilated rooms, where Surat cotton is used.

"The first process the raw cotton undergoes is the mixing of one staple with another. Much dirt and dust is disengaged in this operation. The respiration is affected from the dust irritating the respiratory passages of the mixers, and coughing and sneezing are the frequent consequences, which disengage from the bronchial membrane a quantity of slaty-coloured expectoration, which, when placed under the microscope, is seen to consist of very fine short fibres of cotton in air-bubbles and mucus. The sneezing is occasioned by the same material irritating the olfactory nerves during nasal breathing. The arms and hands of mixers are not unfrequently affected with a cutaneous rash, much resembling nettle rash. This may partly arise from fine sand and short fibres of cotton destroying the epidermis, and irritating by their presence the true skin. Their complexion is pale and sickly. After passing from the mixers, the cotton passes through the hands of the willowers and scutchers. When ventilation is not assisted by ventilating chimneys of tin or wood, which take off more effectually the dense atmosphere with which these rooms are charged, the willowers and scutchers suffer in the same manner as the cotton mixers. From the immense velocity of the machines used, the revolutions being 1500 per minute, the quantity of short fibres of cotton set afloat in these rooms is very great. It would be difficult to recognize a man at twelve yards' distance, from the density of floating fibres, modified, of course, very much by a wet or dry day. The strippers, grinders, and card-room hands are engaged in the next process of cotton manufacture. They mostly suffer from a spasmodic cough, sore throat, expectoration of blood, pneumonia, and confirmed asthma, with oppression of the chest. Various expedients are resorted to to liberate the small cotton fibres by expectoration from the pulmonary air-cells: tobacco chewing, the use of gin,

and smoking out of the mill are very commonly habitual. The teetotalers use tea and coffee in lieu of these for the same purpose. A carder seldom lives in a card-room beyond forty years of age; many have to give up working much younger. Forty-five to fifty years are their average ages. The next room the cotton comes to is the drawing and roving room. Drawers and rovers suffer very little from the small floating cotton fibre. The tonsils are sometimes enlarged, and the pharynx and larynx much injected. They suffer so little inconvenience from these conditions that an ocular demonstration is necessary to convince one's self of their presence. There is comparatively much less floating short cotton fibres in these and the next rooms. The mule and throstle rooms are the next, where cotton assumes the cotton-thread. Their temperature is much higher, ranging from 75° to 90° Fahr. The light is freely admitted through numerous lofty windows. A high temperature and much light are requisite for the spinning of the cotton-thread. The hands in these rooms look pale and sickly; but are lively, cheerful, and active. They suffer much from facial tic and toothache, slight colds, and sore throat during cold and damp weather, probably arising from their sudden transition from the heated atmosphere in which they work to a raw cold one outside the mill on their way to and from their meals. The next class of workers are the packers occupied in the warehouses. They are generally very healthy, active, and much better looking. These rooms are of a moderate temperature, and very well ventilated, which account for the improved appearance and general health of the men employed therein.

"I have now passed through the general affections of operatives engaged in the various processes necessary to produce the cotton-thread from Surat cotton, and shown, as I trust, plainly that these affections arise in a great measure from the circumstance that Surat cotton has a much shorter fibre than any other kind of cotton; that its manufacture involves on an average twenty-five per cent. of loss to the spinners; that the teeth of the machines through which it has to be passed are of necessity set closer for the better working of it; and that the health of the operatives employed suffers much more, from its short fibres irritating the epithelial mucous surfaces of the air-passages during inspiration, whether nasal or vocal; and that the only remedy is more effectual ventilation in the mixing, scutching, carding, and drawing rooms. Beyond these rooms I have not observed a greater amount of suffering than from working any other class of cotton. Lastly, whatever principle of ventilation be adopted, the lightness and shortness of the fibre of Surat cotton are so remarkable that a much greater loss than twenty-five per cent. would be observable if increased ventilation be much applied; but this loss would be amply compensated for by a better quality of cotton-thread, bearing an increased marketable value. Many wealthy manufacturers, compelled to use Surat cotton since the cotton famine, have applied increased ventilation to free the mixing and scutching rooms from the additional dust attending its use, and have at considerable expense brought into use powerful fans, more elevated rooms, and other appliances; and in every instance the factory operatives enjoy comparative impunity from what remains of the floating dust. The use of better gins would free the raw cotton of Surat from much of its present dirt, and our East Indian authorities possess the power of enforcing them, which would enhance the value of the cotton, and confer an inestimable boon on the Lancashire hive of wealth and industry."

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43. *Dangers of Slaughtering Diseased Cattle.*—Prof. JOHN GAMGEE, of Edinburgh, has published (*Lancet*, Feb. 13, 1864) the following important observations on this subject:—

"On the 22d of October, 1863, a bull was taken ill on a farm and in a county which I decline to name. My reasons for not mentioning the place are, that every effort has been made to keep the secret, as in a host of similar cases, and it will serve no purpose whatever to expose those who, in ignorance and in consequence of the lax state of our laws on this subject, acted as their neighbours would have done. A labourer on the farm, who had been formerly a butcher, volunteered to slaughter the sick bull, that its carcase might be saved for the butcher's stall. Unfortunately, the poor man had previously injured his hand with a spade, and he performed his task without due regard to the condition of

his wound. It is said that the bull was dying from pleuro-pneumonia, but others declare the disease was of too rapid a type to be the very prevalent lung complaint. Certain it is that four pigs died after eating part of the viscera of the bull, and two dogs nearly lost their lives in the same way.

"The bull was disposed of to a butcher for the sum of £5, and after this, not only was it seen that the pigs and dogs had been injured by eating the flesh, but the labourer suffered intense pain in his hand, was seized with severe febrile symptoms, and died on the fourth day after dressing the bull.

"I am favoured by a surgeon with the following report of the case:—

"'I saw the man for the first time on the second day before his death. I then found a ragged wound, about an inch long, nearly dividing the tendon of the back of the second finger of the right hand. The edges of the wound, for about three-eighths of an inch all round, were very much swollen and dark-coloured; in fact, the wound looked like an opening made with a blunt instrument. The swelling was well defined; there was also severe cellular inflammation of the arm to the elbow, with the usual boggy feel all over, from the back of the hand upward. Fever and the usual symptoms of severe cellular inflammation prevailed, notwithstanding tonics and stimulants. The man sank rapidly (the fever having turned to typhoid), and died on the second morning after I saw him. He was much addicted to habits of intemperance.'

"Many of the readers of the *Lancet* may suppose that this is a solitary case, or at all events a rare one. The usual question may be asked, Why should I, as a surgeon of so many years' experience, not have heard of or seen such cases? To my own knowledge, four other men have died, presenting symptoms such as the above, under similar circumstances and in the same county, during the last four years. Another man, a butcher, nearly lost his life, and the surgeon who attended him asked him what he had done with the diseased cattle he had dressed. This question was asked as the surgeon feared that the carcases were at that time being cut up in the town where they had been slaughtered; but he was somewhat consoled by the usual reply, 'They've been sent to London.'

"During the past year the attention of a number of gentlemen has been directed to cases of serious illness and death in various parts of the country. A landed proprietor wrote me concerning an instance in East Lothian. An animal was slaughtered, packed in a basket, and sent either to Edinburgh or London. After the carcase had been dispatched, the pigs were taken ill, and several died; they had eaten of the animal's entrails. The man who dressed the bullock nearly lost his life, and only recovered after nearly losing his eyesight. Some liquid from the thorax was splashed against this man's face, and he suffered severely from inflammation of the face and trunk. His eyes were most seriously affected, and vision has only been restored in one.

"In the Edinburgh slaughter-houses similar accidents have been witnessed, though every effort is made to conceal the truth; and one case which occurred in 1863, was identical with the one that occurred in East Lothian. During the outbreak of malignant anthrax in Lincolnshire last autumn a shepherd scratched his arm whilst dressing a sheep, and he very nearly lost his life.

"It is now about fourteen years since I first began to agitate the question of cattle disease in relation to the public health. During that time I have reported outbreaks of anthrax and of splenic apoplexy, and have repeatedly drawn attention to the deaths amongst pigs, dogs, ferrets, &c., from eating the viscera of diseased cattle slaughtered. I have striven, as best I could, to specify the form of disease communicable to man, and which renders the flesh of such animals unwholesome; and my opinion, based on a very careful consideration of the whole subject, is, that the public health is materially affected by the wholesale slaughter of diseased animals as human food. Several years ago I declared that it was impossible that human beings were not frequently injured by the eating of the flesh of cattle that had died of splenic apoplexy in this country; and the reason why cases have not been published is, that the carcases have been sent to large cities, *where they would not be distinguished from the carcases of perfectly healthy animals*, and the evil results of eating the poisonous flesh could not be distinguished from any ordinary case of dysentery or

typhus. The best proof of defective observation on these subjects is afforded us by the trichinous disease, of which not a single fatal case has been recorded in this country, but many abroad. That the disease is often amongst us is certain, and the infant that died in Paisley last year, as the result of eating 'measly (?) pork,' undoubtedly, in my mind, succumbed to trichinous infection.

"Knowledge gathers slowly, and medical men must proceed with prudence in drawing inferences from cases observed; but I hold that they have hesitated too much and too long in raising their voices against the filthy and demoralizing practice of slaughtering diseased animals as human food. With a proper organization, I will engage to reduce the mortality in the London dairies from forty and fifty per cent. per annum to four and five. This would at once prevent the sale of several thousand diseased cows as human food in the metropolis alone. Would not such work be better worth paying for than inspection of markets? and is it not worthy of the strongest recommendation on the ground of economy, if not on that of saving human life? We 'strain at a gnat and swallow a camel' when we condemn the French for their vivisections, and allow our population to be cut down in thousands by painful and preventable diseases. On no ground can we defend the slaughter of diseased cattle, and medical officers of health need not wish to be fortified by evidence of cases of death in man from eating diseased meat in order to interfere vigorously with the traffic in diseased animals. That traffic is the most potent cause of disease in animals themselves, and unless checked our stockowners will suffer even more in the future than they have in the past. We cannot keep pace with the demand for meat, and prices are ruling higher every year. To secure an adequate supply of wholesome animal food we must devote ourselves to the prevention of disease amongst animals, and no greater blunder was ever committed than that of declaring that our poor must starve if we condemn all the diseased animals sent to the butcher. The poor may console themselves a little by the reflection that it is the finest cattle in the best condition that usually die of splenic apoplexy, and the accidents which befell the pigs and ferrets from this cause are more likely to be witnessed in the homes of the wealthy than in those of people who cannot afford to pay the highest market price for beef."

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## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

44. *Etherization followed by Death.*—At the meeting of the Imperial Society of Medicine in Lyons, on July 20, M. CHASSAGNY communicated the case of a lady aged 40, to whom ether was administered previously to the removal of an urethral polypus and two sebaceous cystic tumours on the head. Thirty *grammes* of ether (rather less than an apothecary's ounce) were used; but the anæsthesia produced was incomplete, and the patient was aware that the operations were being performed. The administration of the anæsthetic was not pushed further, because the stage of excitement did not manifest itself, and because, on the contrary, general coldness and slowness of the pulse were present. On the completion of the operation, which occupied a quarter of an hour, vomiting set in; the coldness increased, and was accompanied by clammy sweats; and the patient had convulsions, attended with foaming at the mouth. The attack passed away in a few moments, but soon returned with equal intensity. After the fourth attack, the patient died. M. Chassagny considered that the patient had died of eclampsia induced by etherization, which was thus the indirect cause of death. She had previously been subject to epileptic vertigo.—*British Med. Journ.*, from *Gaz. Méd. de Lyon*, 16 October, 1864.

# AMERICAN INTELLIGENCE.

## ORIGINAL COMMUNICATIONS.

*Ligature of the Femoral Artery.* By PHILIP S. WALES, M. D., Surgeon U. S. N.

James O'Neal, aged 30, born in England, was sent to the hospital March 28th, 1863, with a gunshot wound of the left thigh, received under the following circumstances. He was one of the crew of the prize steamer "Nicholas the First." When our men boarded her this individual, drunk, it appears, seized a keg of powder and rushed towards the furnaces to throw it in; providentially an officer saw him before the horrible deed could be executed, and brought him to the deck with his revolver. The ball entered the left thigh at its inner aspect at the junction of the middle and lower thirds, taking a slightly oblique course downwards and outwards, passed behind the femur through the limb, and emerged at the outer side. At the time there was a profuse arterial hemorrhage, which the medical officers who first saw him controlled with a tourniquet. Ten days elapsed before he arrived at the hospital. In the mean time an enormous diffused traumatic aneurism had developed itself, occupying the lower two-thirds of the thigh, and its pulsation could be felt everywhere over this portion of the limb, except a narrow strip of surface extending along its outer side. The patient complained of slight pain; but what gave him most concern was the great sensation of weakness which, he said, annoyed him more than anything else. The aneurismal bruit was distinctly marked and heard immediately after the impulse is felt.

*April* 2. We performed the operation of ligature of the femoral in its upper third, being kindly assisted by Surgeon Sharp and Assistant Surgeons Burnett and Winslow, to all of whom I am particularly obliged for the valuable assistance rendered in this difficult case.

From the enormous swelling of the limb from the knee to the groin there were no guides to the artery, and the depth at which we expected to find it induced us to make an ample incision (3½ inches) in its supposed course; soon its pulsation was felt leading directly to the sheath, which was slit up upon the grooved director about half an inch, giving vent to about a drachm of dark blood; the artery needle, armed with a waxed thread, was then at once passed around it from within outwards. The thread was knotted and all pulsation ceased in the tumour; the edges of the wound were then slightly brought together by compresses and bandages, and cold water dressings applied. After being made comfortable in bed, the patient soon rallied from the immediate effects of the anæsthetic—chloroform—and fell in a quiet sleep from which he awoke several hours afterwarks much refreshed, and expressing himself as feeling free from any uneasiness in the limb.

3*d.* This morning the patient feels very comfortable, having obtained a good night's rest from a full dose of solution of sulphate of morphia. The temperature of the left leg is good, the femoral of the groin pulsates slightly

—69 a minute. Has not that annoying sensation of weakness before complained of, and there is less tumefaction of the thigh.

4*th*. Doing well. Took another dose of morphia yesterday evening, producing a good sleep during the night; complains of slight pain in the leg; wound of operation suppurating slightly; slight pulsation in the tumour can be felt when the hand is pressed forcibly against it. Continued water dressing.

5*th*. Decidedly cheerful and improving; bowels have been moved freely, and his appetite, which since he was shot has been entirely absent, begins to improve; he says he wants something to eat; a trifling pain shoots from his foot towards the point of ligation. Wound discharging freely. Continue same dressings, and give chicken soup.

6*th*. Now sleeps well at night without an opiate; bowels regular, appetite improving, and is entirely free from pain in the limb. All pulsation has disappeared from the limb. Continued dressings and diet as usual.

7*th*. Has had severe pain in the left ankle since morning. Continued same means.

8*th*. Changed the position of the limb, removing all pressure from the outer malleolus with entire relief to the pain. A distinct pulsation can be felt in the posterior tibial artery to-day. Wound still suppurating. Continue means in all respects as yesterday.

9*th*. Doing well. Complains of some uneasiness in the limb, which I suspect results from the restrained position in which it is kept.

11*th*. Has continued to improve; the upper part of the incision has healed from the bottom almost to the surface, with slight discharge of pus, and the limb nearly regained its normal size.

19*th*. Wound nearly all healed, ligation still firm; very slight discharge of pus; appetite good, bowels regular. From the great diminution in the original size of the thigh, the part where the aneurism was situated conveys the sensation of great solidity, and is about the same diameter as the upper part of the thigh.

*May* 1. The ligature came away to-day, and there has been a gradual improvement in the condition of the patient; his general health good, and all the functions going on normally.

30*th*. Was discharged from the hospital cured, and sent to the guard ship for safe keeping, to be disposed of by the naval authorities.

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*Poisoning from the Datura Stramonium in which Recovery followed the Use of Opium.* By A. PAUL TURNER, M. D., one of the Physicians to the Howard Hospital.

Chas. McK——, aged 10 years, and his brother aged 8, both bright and active children, enjoying the best of health, left their home at 10½ A.M., in company with several children younger than themselves, upon an excursion to some vacant lots situated at the distance of over a mile from their place of residence, from whence they returned about 3 P.M., and asked for their dinner as if nothing unusual had occurred. While eating, the mother observed a peculiar uneasiness and a tendency to wander from the subject upon which they were being questioned, and she asked their comrades if they had not been using intoxicating spirits; but were stoutly assured that such was not the case. The two children were then unable to walk, which so alarmed those about that the family physician was sent for. After waiting for him over half an hour, the symptoms becoming more alarming, I was summoned, and reached the house at 4.30 P.M. I found

the children lying upon their backs, their eyelids slightly drooping, corneæ very bright, pupils widely dilated and insensible to the light; conjunctiva injected; face deeply suffused and of a dark crimson colour; an apparent difficulty in breathing; inability to articulate, and in a state of complete insensibility, broken occasionally by a paroxysm, during which they would utter some indistinct sounds and throw the hands about the head as if attempting to ward off some threatening evil; this would soon subside into a semi-comatose state, not the stupidity, however, which results from opium or its preparations, but rather a state of intense apathy, which persisted for a few seconds, when the delirium would again recur unless sooner produced by the efforts of those about to render assistance, when the state of excitement assumed such a form and violence as to render necessary a certain amount of restraint to prevent escape from the imaginary object which engaged the attention; occasionally they would grasp at something in the space in front, appear as if he possessed or rejected it, then turn the head as if called by a voice beside them and attempt to speak to it, the sound resembling a squeak more than the natural tone of voice. Neither of them was able to support himself alone upon his feet, but would take a step or two with a staggering gait, falling to the floor as if intoxicated or in a state of complete exhaustion. During the period of excitement the extremities were in constant motion, co-ordinate only so far as they related to the corresponding limb, yet wanting in that harmony of action which is found in those movements of a higher order, as standing in the erect posture, walking, etc. etc.; there was constant action of the fingers as if attempting to pick something from the person or the bedclothes; at times they would burst into a paroxysm of excessive laughter, which would persist some seconds, then suddenly cease; at times they would have a smile so quiet and pleasant that we could not but contrast it with the highly excited state previously witnessed. The flushed face; the bright eye; dilated pupil, and the peculiar mental state, led me to instantly surmise that the poison was of the order Solanaceæ, and on closely interrogating those who accompanied them, some unripe capsules of the Datura stramonium were produced, with the assurance that all had eaten of the seed which was beginning to assume the brown colour of maturity, and that the two children now so violently affected, had first found them palatable, and not only began to use them first, but even ate them while returning home. It may not be out of place here to mention that in this half-ripe state, the seed do not give the decided taste of the more mature growth, and are not so unpalatable as to cause children to refuse them.

To each was administered an emetic of sulphate of zinc gr. v, and pul. ipecac. gr. x, in the hope that the remains of any unabsorbed material in the stomach might be removed; their jaws being closed, and as they could not be made to comprehend our object, there was no little difficulty in causing them to swallow. Emesis in a short time followed, and among the remains of the undigested food eaten a little while before was found a quantity of the seed, which probably amounted to as much as half a drachm. As there could now be no doubt as to the nature of the article used, cold water effusions were employed, hoping to induce reaction against the tendency to depression of the vital powers by the poison. Having seen reports of cases wherein opium or some of its compounds had been used with the happiest results in counteracting the effects of belladonna, and from the similarity of the action of stramonium and that of

other species of the same order, it at once occurred that opium might not be inappropriate in the present instance, and accordingly to each of the two children was given tinct. opii gtt. vij.

5.15 P. M. I was now joined by Dr. J. H. Slack, who advised a repetition of the emetic of sulphate of zinc, which was administered without immediate result, and the tinct. of opium was again given to each in the same quantity. Twenty minutes later no marked effect having followed the laudanum, another dose of ten drops was given; they are now lying more quiet; dilatation and immobility of the pupils; general appearance unchanged; still insensible, and even when loudly spoken to the eyes would scarcely be turned towards the speaker; still continue to pick at the bedclothes and grasp at the imaginary objects about them, suddenly move as if spoken to and apparently attempt to articulate some reply, the limbs being at the same time actively moved, not spasmodically, however, but as if attempting to perform some action which failed for want of a proper guiding influence.

6 P. M. They appear to lie more quiet now, and the iris, which is taken as the index by which the relative effects of the two substances are to be estimated, still remains dilated and uninfluenced when exposed to the action of the light; are not so frequently excited, though at times laugh immoderately; surface of the body continues very red, though less so than a short time previously. Tinct. opii gtt. v repeated to each; directions were given that the children be allowed to remain on the floor, the clothing to be removed or loosened so much as to permit free circulation and unimpeded movements of respiration.

9 P. M. Both children are held in a sitting posture upon the knee of an attendant, whose attention is fully directed towards preventing them from falling during the periods of excitement, which are less violent and appear to be more in the direction of intelligence. The skin remains as from the beginning, somewhat relaxed though not moist, and very slightly elevated in temperature; pulse 95, compressible and full in volume, and has varied but little from this since the commencement of the symptoms, even during the paroxysmal state, and is then to be attributed, perhaps, to the muscular movements rather than direct action upon the heart of the substance whose effects we are endeavouring to counteract. It is now seen that the pupils are less dilated, though very slightly influenced by the light; the children are able to articulate, but cannot be made to comprehend questions proposed them, and occasionally laugh or attempt to sing; on the whole, their condition may be said to be much improved, but as the effects of the datura are yet so prominent five drops more of the opiate are ordered, with directions that the same quantity be again repeated in 30 minutes.

Wednesday, 9 A. M. The youngest child was now quietly sleeping, but could be awakened without difficulty. During the night ten drops more of the laudanum had been given to each; the eldest was quietly lying upon the bed; pupils more contracted than when last seen, and became more so when exposed to a strong light; skin moist and cool; has lost that efflorescent appearance which was before so strongly apparent; pulse 86; respiration normal; responds yes and no to necessary inquiries, but does not complain or attempt to converse; is wholly uninterested in all that passes about him, and as he lies on his side smiles as if amused at some ludicrous idea passing in the mind; at intervals has slept during the night, though frequently disturbed by illusions. As the symptoms of the stramonium were now so little preponderant as to give no uneasiness as to

the immediate result, all medicinal interference was laid aside, and rest in a darkened room with perfect quiet was enjoined for the day.

6 P. M. Much improved since last visit; pupils nearly normal in diameter, but not quite as susceptible to light as desired; complains of slight dryness of the fauces; some vertigo with occasional delirium through the day; and the eldest, when asked in reference to his thoughts, replied that he felt as if dreaming, though not asleep. When seen the next day there had been a free evacuation of the bowels with much apparent benefit; they were playing about the door without the least abnormal symptom; conversed with freedom, and were perfectly rational.

Though the above details refer to but two cases, yet there were five others, younger, who had partaken of the seed, and in whom dilatation and immobility of the pupils was so manifest that emesis was induced in each, and they were kept under close observation for any signs which might demand attention, but as vomiting had been so early produced, nothing of the kind occurred.

When we consider the violence of the symptoms, the rapidity with which they became evident, and the quantity of opium used in a few hours, we cannot but help drawing the inference that there must have existed some antagonism between the two.

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## DOMESTIC SUMMARY.

*Lithotomy in Young Persons.*—Dr. J. Mason Warren has communicated to the Boston Society for Medical Improvement two cases of the lithotomy in young persons, with some interesting remarks on operations for stone in the bladder.

In the first case the ordinary bilateral operation was performed, in the second some novel procedures were adopted, and we therefore subjoin Dr. W.'s account of it.

Jacob Banks, æt. 13, entered the Massachusetts General Hospital in March, 1863, on account of great suffering in the region of the bladder, accompanied by incontinence of urine. Two years before, he noticed an occasional difficulty in passing water; at times a sudden stoppage of the stream occurred, and the urine was now and then a little bloody. Of late the symptoms had become more urgent and the pain constant, so as to confine him to his bed. At this time the urine dribbled away, and the skin of the penis, scrotum and thighs had become red and irritated by it. The prepuce, as in the last case, was much elongated.

On introducing a sound, the instrument encountered much resistance at the neck of the bladder, and at once came in contact with a stone. The bladder was quite empty of urine, and the calculus meeting the sound at different points, while enveloped in the mucous folds, gave the impression of the existence of two or more stones.

It was decided to perform lithotomy, first relieving the external irritation by cleanliness and suitable dressings, and then evacuating the bowels by a dose of castor oil, followed by an enema, on the morning fixed for the operation.

The operation which was performed combined some of the more important features both of the median and bi-lateral methods, and seems to offer some advantages over either. A sound of medium size was passed into the bladder, the meatus urinarius, which had become very much contracted, being first slightly enlarged by the knife. The skin was then divided in the median raphé, and the dissection continued in the same line until the membranous part of the urethra was exposed. This was next opened, and the attempt made to introduce the double "lithotome caché" of Dupuytren. Owing to the unyielding

condition of the neck of the bladder, the lithotome could not readily be passed in; a probe-pointed bistoury was therefore substituted for it, and the prostate divided on both sides. The finger now entered with ease, and a large stone was felt very high up in the bladder. Attempts were made to extract it with a long pair of polypus forceps, and then with the ordinary lithotomy forceps, but without success, owing to the great size of the stone; the cut in the prostate was therefore enlarged, and the attempts at extraction renewed, but still unsuccessfully. As it was not deemed safe to enlarge the incision in the prostate further with the knife, the two forefingers were introduced, back to back, and the substance of the gland slightly torn. A larger pair of forceps was then passed in, and by embracing the whole stone within its jaws it was extracted without further difficulty. A bit of catheter was placed in the wound, and the patient sent back to bed.

On the ninth day the urine began to pass through the urethra, and from the twelfth day none escaped by the wound. At the end of three weeks the patient was discharged, with the external wound nearly healed, and free from all symptoms of stone.

The calculus, which appeared to be composed of the triple phosphate of magnesia and ammonia, was large and very rough; it measured three and a half inches in its longest circumference, and two and three-quarters in the shortest; its weight was half an ounce.

Dr. W. said that he was led to perform the operation in the manner related, viz., by making an incision through the skin in the median raphé, instead of the cross cut, employed by Dupuytren, from having observed how easily these parts could be dilated in the incisions practised in perineal section for the division of strictures, in some cases impassable by the smallest sound. In these cases, after cutting through a deep perineum filled with inflammatory exudation, it is often found necessary to exercise much patience and to spend much time in tracing the urethra beyond the stricture. Having had occasion, during the past few years, to do a number of these operations, most of them entirely without any guide, he was led to the reflection that it would be very easy in this way to perform the operation of lithotomy when the operator is guided by the presence of a large staff in the urethra. When the operation by this median section is performed deliberately, the operator has the parts divided freely open to the view, which is not the case in Dupuytren's operation, which has to be performed mainly by the sense of touch. By this method, also, the vessels are much less likely to be wounded than in the common operation. Although different kinds of operations must of necessity be practised to suit different cases, the present method would seem to be the most direct and natural one for arriving at the bladder. Since performing it, Dr. W. said he had found that a similar operation had been suggested by Mr. Erichsen, who had not, however, performed it upon the living subject. Mr. Allarton's and Mr. Beaumont's operations, although done in the median line, are essentially different.

Dr. W. stated that he had now operated upon about thirty cases of stone in the bladder, and thus far had been so fortunate as not to lose a single patient. Most of the operations had been done by the crushing method, which he had found applicable to all cases except in very young persons; the oxalate of lime, or "mulberry calculus," when in an adult patient, and of a moderate size, not being an objection on account of its hardness. In young subjects, on account of the small size of the urethra, the danger of its obstruction by fragments, and the comparative safety of lithotomy, he had generally performed lithotomy by the bi-lateral section, and the recoveries, without exception, have been safe and speedy.—*Boston Med. and Surg. Journ.*, March 10, 1864.

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*Ligature of the Common Carotid.*—Prof. C. A. POPE, of St. Louis, records (*St. Louis Med. and Surg. Journ.*, January, and February, 1864) the following interesting case of this:—

"The late General Bayard, who was killed at the battle of Fredericksburg, received an arrow-shot wound in the left upper jaw, on the 11th July, 1860, whilst a lieutenant in New Mexico, in a skirmish with the Indians. The iron point, spear shaped, and two and a half inches long, with a small neck for the

attachment of the wooden shaft, was driven with force, entering a little below the middle of the orbit, and with a slight obliquity backward. The surgeon of the post immediately endeavoured to extract the foreign body. At first it was hoped that this might be accomplished by traction upon the arrow itself, but this was thereby only separated from the iron point, which remained firmly impacted in the bone. Different forceps were then resorted to, and after a trial of two hours the effort was abandoned.

"The absence of suitable instruments, the slight hold which could be obtained on the offending body, as the small neck was all that could be seized, and above all the firm impaction, sufficiently account for the failure of extraction. Slight hemorrhages from the corresponding nostril followed within the subsequent four weeks, and on arriving at St. Joseph, a more serious one occurred.

"The patient reached St. Louis five weeks after the reception of his wound. There was some tumefaction of the left side of his face. The wound at the time had skinned over, so that no foreign substance could be seen, but on gentle pressure with the finger, a hard point was perceptible beneath the integument. There was a muco-purulent discharge still issuing from the nostril, proceeding doubtless from the antrum. On incising the imperfect cicatrix, I felt the projecting neck, and supposing that the arrow point, after so long a time, might be somewhat loosened by the efforts of the organism, I attempted its extraction with the dressing forceps of the pocket case, but found them wholly inadequate. I at once supplied myself with instruments of various kinds, and with a powerful forceps succeeded in one or two efforts in extracting the offending body. This was followed by a troublesome bleeding, both from the nostril and the external wound. By rest, opium, cold, plugging and pressure, this was duly arrested. Several slighter hemorrhages subsequently occurred, but they gave rise to no uneasiness.

"The case now progressed favourably, and the patient was able to get about the streets. He walked to my office, and complained of some inability to separate the jaws, a difficulty, by the way, which had existed all along; I directed him to use gentle and gradual efforts at opening the mouth. In less than an hour his troubles recommenced. The whole cheek and jaw became hot, swollen, and painful. Fever, with renewed hemorrhage, set in, and caused me much anxiety. The same means of arrest first tried did not avail. Extensive extravasation of blood took place, and in order to relieve the pain, tension, and possible sloughing, I deemed it proper to make free counter openings, both in the mouth and on the cheek and neck. From these, large grumous clots were turned out, and through the inner opening the finger's point could be carried round the almost denuded bone, and lodged high up in the pterygoid fossa. The hemorrhage continuing with various and delusive intermissions, the case became critical. Finally, for three successive nights, these came on regularly at midnight, and were copious and exhaustive. From such repeated losses of blood, the patient had now become reduced to the lowest degree, when the further issue of a few ounces more might have turned the scale against him. I then determined to tie the carotid. This was done on the night of the 16th of September, more than two months after the reception of the wound. Such was the extreme condition of the patient that he fainted during the operation, although in a recumbent position. The operation was a delicate and difficult one, as the parts were very much swollen and altered by sanguineous extravasation and inflammatory effusion, and the incision being correspondingly deep, the effect of artificial light in such cases, at all times bad, was only the worse—for whilst the surface of the wound was well lighted, the sharp, deep shadow rendered its depth almost invisible. The touch, therefore, superseded sight. There was no more hemorrhage. Opium and nutritious ingesta were freely given, and the patient continued to do well. From the thoroughly anæmic state, and the effects of interruption of the cerebral circulation, caused by the ligature, the patient's mind was somewhat impaired, and I feared some altered nutrition or softening of the brain. These symptoms, however, gradually yielded, and after several weeks he was again up and about. Being rather impatient and self-willed, he went out before I deemed it prudent for him to do so. The ligature was slow in coming away, and for some weeks after its fall, a small fistulous opening re-

mained. The lieutenant now left St. Louis for West Point, to which place he was assigned for duty. When on a visit to his family in New Jersey, and travelling by railroad at night between New York and Philadelphia, after much bodily fatigue, a further hemorrhage occurred from the still unclosed fistula of the cervical wound. By rest and moderate pressure this was relieved. This bleeding was the last—the wound healed and the patient recovered his usual health. There always remained, however, an unpleasant fulness of the affected cheek and masseteric portion of the face."

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*Treatment of Gunshot and Penetrating Wounds of Chest and Abdomen by Hermetically Sealing.*—B. HOWARD, M. D., Ass. Surg. U. S. A., advocates (*Amer. Med. Times*, vol. vii., No. 14) the treatment of gunshot wounds of the chest and abdomen by a plan which he calls "hermetically sealing." The following is his description of this mode of treatment:—

"All accessible foreign bodies having been removed, introduce the point of a sharp-pointed bistoury perpendicularly to the surface just beyond the contused portion, and, with a sawing motion, pare the entire circumference of the wound, converting it into a simple incised wound of an elliptical form. Dissect away all the injured parts down to the ribs, then bring the edges of the wound together with silver sutures, deeply inserted, at not more than a quarter of an inch apart; secure them by twisting the ends, which are then cut off short and turned down out of the way. Carefully dry the surface, and with a camel's-hair pencil apply a free coating of collodion over the wound; let it dry, and repeat it at discretion.

"For greater security, shreds of charpie may now be arranged crosswise over the wound, after the manner of warp and woof; saturate it with collodion, and when dry repeat the process, until the wound is securely cemented over. As a still greater protection, a dossil of lint may then be placed over the part and retained with adhesive straps.

"If there be a tendency to undue heat in the part, it may be kept down with cold affusion; should any loosening of the dressing occur, an additional coating of collodion may be applied. The sutures must not be removed until healing by first intention is complete.

"Should suppuration occur, so as to occasion distressing dyspnœa, proceed to treat it in all respects as a case of empyema, introducing the trocar at the most dependent point, and taking special care to avoid the admission of air."

Deputy Inspector-General T. LONGMORE, Professor of Military Surgery in the British Army Medical School at Netley, and one of the most experienced and learned military surgeons of the day, makes (*Lancet*, Jan. 2d, 1864) the following very interesting remarks on this mode of treatment:—

"In considering the proposed treatment, what first attracts notice is the absence of any limitations in its application, and the assumption that healing of the wound by the first intention can be secured in all such cases. It is the unqualified manner in which this plan of treatment is put forth that makes me think it important to notice it; for if put into practice as described, I feel certain it must lead not only to much disappointment, but occasionally do considerable harm. The wounds of the chest to which it is applied are simply designated 'penetrating wounds;' but it is obvious from Dr. Howard's remarks that he includes perforating wounds, and indeed all wounds in which the cavity of the chest is opened, by gunshot, with or without wound of the lung. As I have already explained, the variations which are constantly found in the accompanying circumstances of a number of wounds of the chest by gunshot involve corresponding variations in their degrees of gravity and probable issues. The difference between an ordinary penetrating wound by gunshot, and a perforating one, is immense; in the one case the projectile is probably lodged; in the other it has passed out. Again, in either a penetrating or a perforating wound most important differences arise in the nature of the injury and the effects of the treatment, according as the lung is penetrated or not; and serious differences also depend upon the part of the lung penetrated or traversed by the ball. All these circumstances should be noted and taken into account in estimating the value of a

special plan of treatment in a given number of cases. If a ball passes through or near the root of the lung, it is scarcely possible to prevent a fatal result by any plan of treatment; if the track of the ball has been limited to the periphery of the lung, and the constitution of the patient and opportunities of treatment be favourable, we have a right to expect a favourable cure in a considerable proportion of cases under the mode of treatment which has hitherto been in ordinary use of late years, and which I have already described to you.

"The surgeon's efforts to secure healing by the first intention in the way named in gunshot wounds will, I think, be attended with success in only a very small proportion of exceptional cases. It is the rule of practice among army surgeons to close completely, by sutures, compresses, adhesive plasters, and bandages, all wounds of the chest—such as incised and stabbing wounds—in which there is thought to be a probability of union by the first intention being obtained. Not only the relief to the breathing by rendering more complete inflation of the lungs practicable—which is the immediate effect of this operation in an incised wound of the soft parietes of the chest and periphery of the lung—but the arrest of the hemorrhage (if this complication exist), together with the prevention of subsequent extended pleuritis and pleuro-pneumonia, are sought to be obtained by these means. And as in many cases the urgent symptoms have gradually abated under this treatment, and eventually respiration in the wounded lung been re-established, it has been rendered evident that the wounds had become closed by the adhesive process. You will find such cases fully recorded in the works of Guthrie, Larry, Hennen, and others. But in treating cases of incised wounds we cannot rely upon obtaining healing by adhesion even of the external orifice, although this may be uncomplicated with injury to bone or cartilage; and we should be prepared to meet these abortive attempts by other definite plans of treatment. The restlessness of the patient, the natural movements of the chest in respiration, inflammatory action, cough, weakened health, habits of life, and special conditions of the tissues, may thwart our attempts to effect this object. When to these sources of failure we add continued hemorrhage at the seat of injury in the parietes, and torn cartilage or divided ribs—such frequent concomitants of these injuries—the difficulty of obtaining healing by the first intention is still further increased.

"When we leave incised wounds and approach those of penetrating gunshot wounds—at least those inflicted by projectiles as large as ordinary musket-balls—the probability of obtaining healing by the first intention seems to be altogether absent. Here not only all the ordinary sources of prevention of this desired result which I have just mentioned exists in an exaggerated degree, but, in addition, a rib, when struck, is not simply divided as by a sword, but is contused and splintered, and the soft parts around the opening made by the ball, for a distance varying according to the size and shape of the projectile, and its amount of momentum, are bruised, and their vitality and reparative tendency proportionably diminished. To remove this sphacelated surface and surrounding bruised structures by incision, and then to force the edges of this enlarged opening together by sutures (for it is to be remembered, even in cases where ribs and their cartilages have escaped, the intercostal muscular tissues and pleura—not merely the integument—are contused and torn), appears to involve the necessity of such a strain as would prevent all probability of cohesion by first intention, even if such further impediments as costal movements, sudden impulses by coughing, and symptoms of inflammation arising, were not in existence. Experience has hitherto taught that in these injuries provision must be allowed for the escape of sloughs and suppurative discharges from the parietal wounds—not to mention other circumstances; and that to pent them up by closed compresses is to thwart nature's plans of attempting cure, and to aggravate the evils which have been already inflicted. Hence the rule has arisen in all cases of *incised wounds* of the chest, whether hemorrhage be present or not, to close the wound by suture and compress as early as possible, and to seek for union by adhesion; but in *gunshot wounds*, not to close by suture, and only to make accurate closure a matter of necessity where they are accompanied by active hemorrhage.

"Baron Larry, in his memoirs of the Egyptian campaign,[1] has given an excellent explanation of the manner in which the urgent symptoms of an incised wound of the lung with hemorrhage, when the hemorrhage arises wholly from the pulmonary vessels, are frequently caused to cease, if the wound in the chest be accurately closed. While the wound is open, the inspired air, finding a ready way of exit by the opening in the lung, constantly opposes the cohesion of the margins of this opening, at the same time that its escape in this way prevents the distension of the air-cells of the surrounding lung-structure, which would lessen the arterial flow, and accelerate the return of the blood by the pulmonic veins. When the wound in the chest has been accurately closed, after allowing the blood already effused in the pleura to escape through the opening by favourable position, the air introduced into the lung by breathing, not finding the same way of issue, fills more completely the small bronchial tubes and air-cells, facilitates the return of blood to the heart, causes the divided lung surfaces to approach each other, favours the construction of the orifices of the wounded vessels, and assists by these means, as a consequence, the adhesive process. But in the case of a contused and ragged canal being opened through the lung by a projectile passing into or through it, all the circumstances are manifestly changed: if bleeding is going on from its surface, neither the passage of the air through the wound in the chest-wall nor its restraint can exert influence upon it, for the track of the ball will remain patulous under all circumstances, so far as the act of respiration is concerned.

"Let me briefly consider the three advantages which Dr. Howard advocates for the hermetically sealing treatment in gunshot wounds. Dr. Howard states the causes of fatality in gunshot wounds of the lungs to be hemorrhage, dyspnœa, and suppuration; and that these may be restrained and modified, if not prevented or removed, by the simple operation already described.

"*Hemorrhage*, Dr. Howard rightly places first amongst the causes of fatality. It is the symptom which of all others alarms the surgeon; for he cannot but feel how much the power of nature to arrest the flow of blood, and how much the result of his own endeavours to aid nature in her efforts, must depend upon accidental circumstances connected with the course of the projectile and the injuries it has inflicted, which it is entirely out of his power to control. The track of the bullet is out of sight; the injury it has done to the lung is out of reach. It may be judged that vessels of the largest size have not been divided as it traversed the viscus, or death would have been nearly instantaneous; a surmise may even be made of the part of lung wounded by the situation of the aperture of entrance, or, if two openings exist, by a supposed line connecting them. But such surmises are often proved to be erroneous by post-mortem inspection: even the source of the hemorrhage, whether it be wholly pulmonic, or wholly parietal, or the two combined, cannot be diagnosed with certainty in these complicated wounds. It is not to be wondered at, then, that under such circumstances of doubt and consciousness of helplessness, surgeons, though recognizing the differences between a gunshot and an incised wound of a lung, should nevertheless, almost instinctively, stop the gap through which the life-blood of the patient is seen to be flowing. Although the surfaces of the wound in the lung cannot be brought into contact and coaptation, there is still the hope that as the blood accumulates within the pleura it may exert such a pressure upon the wounded lung, and, perhaps, to plug up the mouths of the open vessels, as to stay the flow of blood and procure time for the saving processes of nature and the application of remedial measures on the part of the surgeon that may lead to the recovery of the patient. And the most experienced army surgeons have long recommended this course under circumstances of gunshot wounds *with profuse hemorrhage*. 'Hermetically sealing,' thus applied, is only a new term: the practice is not new. Immediate closure of the wound is, at the present day, the general practice of all surgeons in such cases. The difference in the treatment between the practice of *closure* and *hermetically sealing* is, that in the one no attempt is made to obtain healing of the wound by the first intention, which it is not expected can be obtained in openings made

[1] Mémoires de Chirurgie Militaire, tome ii. p. 155. Paris, 1812.

by gunshot; and, secondly, that the continuation of the closure is made subject to other contingencies which are not unlikely to follow the injury. It frequently happens in such cases that the flow of blood, after the closure, is not arrested until the accumulation on the wounded side is so great that the pressure exerted upon the heart and sound lung is strong enough to threaten death from asphyxia. It is manifest under such circumstances that the wound cannot be kept hermetically sealed; it must be reopened, some of the effused blood allowed to escape, and there still remains the hope that the weakened state of the circulation, and the usual condition consequent on loss of much blood, with the aid of proper remedial measures, may favour the prevention of further hemorrhage. If we persist, under these circumstances, in maintaining the hermetically sealing of the chest—if Dr. Howard's injunction that the sutures are not to be removed until healing by the first intention is complete is attempted to be carried out—I fear the risk will be run of causing the death of the patient by suffocation.

"*Dyspnœa* is a symptom which may depend on several causes. It may be induced by the very circumstances I have just described, after closure of the wound—viz., continued hemorrhage and accumulation of blood in the cavity of the chest, and sealing will not then afford relief: if it depend upon the interference with natural respiration such as has been described to exist in incised wounds of the lung, hermetically sealing might afford relief if there were no complication and the sealing could be maintained long enough. This continued sealing, however, it is believed, the circumstances connected with the discharges, and other consequences of gunshot wounds, will not admit of. But supposing that for the relief of this symptom the chest has been hermetically sealed, an irregularly torn lung, or a lung with the open track of a ball through it, will almost certainly give rise to pneumothorax, and the continued escape of air into the cavity will cause such compression on all the contents of the chest as to aggravate the dyspnœa extremely, and cause imminent danger to life from suffocation. In such a case, again, the wound must be reopened, or another opening practised by the trocar, to afford relief.

"Lastly, Dr. Howard advances that *suppuration* is greatly diminished, if not prevented, by shutting out external air. This is doubtless the case with incised wounds, but can we expect it to be with penetrating gunshot wounds? An uncomplicated wound of this kind, without hemorrhage, without lodgment of foreign bodies, is unfortunately rare indeed, and such complications can scarcely fail but lead to pleuritic effusion and empyema. If the hemorrhage be slight, the blood may be absorbed: but if it be in its usual quantity, and not evacuated, it will irritate the serous sac, and produce the same effects as foreign bodies. Mr. Guthrie's experience in the Peninsular War led him to state, that in cases in which there was not a free communication between the wound in the parietes and the cavity of the chest pleuritic effusion was the principal danger to be feared. 'When the external wound,' Mr. Guthrie says, 'has been closed, or is so partially closed as not to allow the escape of the effused fluid, it is commonly the immediate cause of the death of the patient. Its secretion and early evacuation are, therefore, the most important points to be attended to in wounds of the chest.'[1]

"I have thought it right to consider this subject at some length, because I fear, if penetrating gunshot wounds of the chest are treated indiscriminately by hermetically sealing the external wound or wounds, a fatal termination will be induced in some cases which might terminate otherwise under the more ordinary methods of treatment. But if my fears in this respect should be proved to be groundless, and practice shall bring to light an improved method of treating these serious injuries, military surgery will be greatly indebted to its author; for it is unhappily most true that hitherto, in all campaigns, the proportion of fatality in really penetrating and perforating wounds of the chest has always been excessively large. I believe the proportion of fatality would even appear greater than it does in some tables if the diagnosis were more accurately made in the various hospitals from the combined returns of which

[1] Commentaries on Surgery, 5th edit., p. 382.

such tables have been composed. Easy as one might at first suppose to be the diagnosis of a musket-ball wound of the chest, whether penetrating or non-penetrating, experience shows that it is not so. Partial circuits of balls beneath the integuments and the muscles of this region, beneath the scapula, perhaps complicated with great bruising, fracture, hemorrhage, and attended with dyspnœa, hæmoptysis, and faintness, deceive the unwary at once into the belief that the chest must have been opened and traversed by the ball when the pleura has escaped entire. The circumstances of field hospitals for some time after a battle too often add to the chances of inaccurate diagnosis of particular wounds, and errors, once made, are not likely to be changed in the tabular returns, although the nature of each case may be more truly arrived at in the secondary or general hospitals, through which the patients subsequently pass. I have repeatedly seen cases returned as *penetrating wounds*, in which I have been able to demonstrate satisfactorily that the cavity of the chest has not been exposed at all. You will find several such cases described by me in the last volume of the *Army Medical Reports*, under Wounds of the Chest. If, as has been stated, a field hospital should be established in America for the reception of gunshot wounds of the chest, and the cases be submitted to the treatment I have been commenting upon, it is especially to be hoped that the diagnosis in each case shall be in the first instance established and defined as accurately as possible, so that the value of the observations made on the effects of this treatment, and of the tabular deductions as to its final results, may not be impaired by any doubts as to the nature of the series of cases which have been subjected to it.

"No pains appear to be spared by the authorities in America to encourage professional investigations of this nature; and under the able direction of the energetic Surgeon-General, Dr. Hammond, and from the observations of the hundreds of medical officers who are labouring in the immense field of campaigning practice which is now afforded in that country, we have every right to expect that great advances will be made there in the science of Military Surgery."

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*Ligature of the Left Subclavian inside the Scalenus Muscle, together with Common Carotid and Vertebral Arteries for Subclavian Aneurism. Hemorrhage from the distal end of the Subclavian. Death on 42d day.*—Professor PARKER presented to the New York Pathological Society, October 28, 1863, a specimen of subclavian aneurism of the right side, which he had removed from the body of a man with the following history: During the month of August, 1862, a swelling about the size of a walnut made its appearance, without assignable cause, above the centre of the patient's right clavicle. It did not increase for a period of seven months, when it began slowly to enlarge, so that at the end of a year, when Dr. Parker was first consulted, it had attained the size of a hen's egg.

The diagnosis of aneurism was at once made, and the patient was advised to remain for some time quietly at home, take no violent exercise, and live upon vegetable diet. When he was next seen, the tumour had increased somewhat in size, and by pressure upon the axillary plexus, had given rise to considerable pain in the arm of the affected side. He was advised to submit either to the operation of ligation of the subclavian artery with its uncertain results, or to amputation at the shoulder-joint. At the end of four or five weeks, the patient again presented himself; the tumour had then very much increased in size, and he was suffering extremely from pain in the right arm. He was then admitted (September 2, 1863) to the New York Hospital. His nights were sleepless, and there was a very singular change in his circulation. When last seen, the pulsations in each wrist were regular, and numbered 76; now the pulsations in the right wrist could hardly be appreciated, and on the left side there was nearly the same condition of things present. The pulsation of his carotid varied from 120 to 130. A consultation, which was called, resulted in a decision to tie the common carotid near the bifurcation, and secure a good plug, and also the subclavian inside the scalenus muscle, together with the vertebral artery. It was thought best to ligate the vertebral artery, in order to guard against the acci-

dent which occurred in Kearney Rodgers's case of ligature of the left subclavian in 1845. Dr. Rodgers applied a ligature just inside the vertebral artery, in the first division. His patient went on very well until the fourteenth or fifteenth day, when he died of secondary hemorrhage, the result of the recurrent circulation through the vertebral into the subclavian. On the proximal side of the ligature was a well-formed plug, but on the distal side there was of course no coagulum whatever.

The operation was entered upon, and the ligatures applied without difficulty. The pulsations in the tumour immediately ceased, as did also the intense pain in the arm. The case progressed exceedingly well until the tenth day, when there was a slight hemorrhage, which, however, was easily controlled. On the twelfth day the ligature from the vertebral artery came away. September 17th, ligature of carotid came away; this was followed by a slight hemorrhage, which, however, had nothing to do with the artery itself. The ligature from the subclavian did not come away until the 26th, twenty-four days after the operation. On the 29th there was a slight and easily controlled hemorrhage. Oct. 1st. Suppuration from the wound was very free; although nature had done a good deal towards closing the opening, the tissues gradually broke away under the influence of pressure, and of the persulphate of iron, which had been used to check the bleeding. Oct. 7. Hemorrhage to the extent of three ounces, and pretty free. In the evening hemorrhage again, about one ounce. He rallied, however, from all this until the forty-second day after the operation, when hemorrhage again occurred, and he died.

The autopsy was made four hours post-mortem, by Dr. Sands, assisted by the gentlemen of the house-staff. The following is his report:—

Right sterno-mastoid removed; clavicles on either side sawn across at the junction of the outer with the middle third; and the sternal portion removed, together with the sternum, the costal cartilage having been previously divided; pericardium opened, and an incision made into the aorta, through which a pipe was introduced, and water injected upwards. After a considerable quantity of water was thrown into the vessels, some of it was seen to issue from what was afterwards found to be the distal end of the right subclavian artery; more escaping, however, from the proximal end. The water also appeared through the left internal mammary, which had been cut in raising the sternum, but more through the right internal mammary, although this had likewise been divided. The wound was deep, extensive ulceration having taken place to the right of the trachea; at its bottom was a round opening, which, upon examination, proved to be the distal extremity of the subclavian artery. The common carotid artery, internal jugular vein, and pneumogastric, were matted together by inflammatory products, as were the tissues generally in the neighborhood of the wound. The carotid artery, beyond the point which had been tied, was occupied by a firm plug that extended nearly to its bifurcation. The proximal portion of the carotid, as well as that of the subclavian, had been destroyed by ulceration, so that the bifurcation of the innominate was no longer visible. The latter vessel presented an open mouth with jagged ulcerated edges, and was filled by a firm fibrinous plug, which occupied nearly its entire length, and projected slightly through its open extremity. The distal end of the subclavian had ulcerated away, carrying with it the proximal portion of the vertebral, the distal portion of the latter being found well plugged. Excepting the vertebral, all the branches of the subclavian were found, and were seen to have their normal relation with the main trunk. They were also pervious, as was shown by the fact that they all admitted a probe introduced through the open end of the subclavian, before described as lying at the bottom of the wound. It was evident, therefore, that the patient had died of hemorrhage from the distal end of the subclavian, the blood having found its way into the latter by the recurrent circulation. The aneurismal sac was larger than a hen's egg, and nearly filled with coagula. The axillary artery beyond the aneurism was healthy and unobstructed.

Several important morbid alterations were noticed on the left side of the neck. The left internal jugular vein was entirely obstructed by a plug of a brownish-yellow color, evidently an old coagulum. The left subclavian artery, just beyond

the origin of its branches, became suddenly smaller than natural, and on examination was discovered to be obliterated for five-eighths of an inch, beyond which it again assumed its normal size and appearance. The occlusion of the vessel seemed to have been the result of inflammation, the coats being thickened and indurated.

Dr. PARKER stated in conclusion that the operation for ligature of the subclavian had been performed in all eleven times by the following surgeons: I. Colles, in 1811, death occurring from hemorrhage on the fourth day; II. Mott, in 1833, death from hemorrhage on the eighteenth day; III. Hayden, in 1835, death from hemorrhage on the twelfth day; IV. O'Reilly, in 1836, death by hemorrhage on the twenty-third day; V. Partridge, in 1841, death from pericarditis and pleuritis on the fourth day; VI. and VII. Liston, in two cases—in the first, 1837, death occurred from hemorrhage on the thirteenth day, and in the second, 1839, death from the same cause on the thirty-sixth day; VIII. and IX. Auverte, in two cases; in both, death was the result of hemorrhage, in the first on the twenty-second, and in the second on the eleventh day. X. Rodgers' case, already referred to; XI. Lastly, Cuvellier, in 1860, death from hemorrhage on the tenth day—carotid and subclavian of right side ligatured.

Dr. BUCK remarked—A case invested with deeper interest than the one before us could scarcely be presented for our consideration. From the post-mortem dissection just described and the specimen exhibited, it appears that, notwithstanding the direct and reverse arterial currents had been intercepted by the ligatures applied to the subclavian, common carotid, and vertebral arteries, the success of the operation was defeated by the circulation still kept up in the aneurismal sac by means of the thyroid axis, internal mammary, and superior intercostal branches. The anastomoses of the terminal branches of the right inferior thyroid with those of the superior of the same side, and also of the internal mammary with the epigastric, must have afforded the channels for restoring and keeping up the circulation in the sac, and thus the formation of coagulum within its cavity has been prevented. Though the ligature upon the subclavian had completely divided the artery, leaving both ends open and exposed, the plug on the proximal side of the ligature had filled up the innominata, and closed it so impermeably as not to permit the passage of water injected at the root of the aorta. On the distal side of this ligature, however, the open mouth of the artery communicated immediately with the sac, and had furnished the repeated hemorrhages preceding death.

The question here suggests itself—Would the ligation of the thyroid axis, the internal mammary, and superior intercostal, in addition to the vertebral, have arrested all circulation in the aneurismal sac, and thus secured the conditions of success. It appears to me that it would have done so, and it is my firm conviction that this expedient ought to be tried, before we concede the impossibility of curing aneurism of the outer division of the subclavian artery by an operation.—*Am. Med. Times*, March 5, 1864.

*Ligature of the Subclavian Artery.*—Dr. ARMSBY, of Albany, has performed this operation on a healthy, robust man, 28 years of age, who had his right arm shattered by the accidental discharge of a cannon, July 7th, 1863.

Gangrene commenced on the second day, and on the third Dr. A. amputated near the shoulder. The stump healed kindly, and on the 12th day after the amputation he was able to go out, and soon after resumed his active business pursuits. His health remained good until September, when the stump began to swell and be painful, and on the 10th of November Dr. A. detected an aneurismal tumour; this tumour increased rapidly, elevating the bones of the shoulder, the pectoral muscles, and filling the axilla. The skin soon after gave way, and the patient lost by a sudden and rapid hemorrhage between two and three quarts of blood, causing faintness and almost loss of pulse. The opening was closed by compresses and adhesive plaster. The only chance of saving life seemed to be by ligation of the subclavian artery above the clavicle, which was performed by Dr. Armsby, on the 19th of November, 1863. The patient was placed on his back, with his face turned to the left. The first incision was about half an inch above and parallel with the superior border of the clavicle, extending from

the sterno-mastoid to the trapezius muscle; and exposing the superficial cervical fascia and the platysma myoides. The second incision was vertical, along the posterior border of the sterno-mastoid, intersecting the first at the margin of this muscle. In elevating the superficial fascia and the platysma myoides, it became necessary to apply a ligature to the external jugular vein, and divide it, as it could not be sufficiently retracted without danger of laceration. Three branches of the supra-scapular and deep cervical arteries bled profusely, and required ligatures. The clavicular attachment of the sterno-mastoid was unusually broad, and one half of it had to be divided to reach the scalenus-anticus, at its attachment to the rib. The deep cervical artery was held upward; the supra-scapular artery and the subclavian vein carefully depressed; and the great subclavian artery fully exposed as it emerged from between the scaleni muscles. In separating the artery from the great veins, which covered and inclosed it, a slight gurgling sound occurred, as if air was entering the circulation. This was a moment of intense anxiety, as such an accident might have been instantly fatal. A bit of sponge was pressed against the part, and as no constitutional disturbance followed, the operation proceeded. The artery was found in a healthy state, and the ligature was cast around it by the aneurismal needle of Mott. The situation of the artery was unusually deep, from the elevated position of the shoulder, by the tumour, but every person present had a distinct view of it before the ligature was tied.

The chief difficulties and dangers of the operation consisted in the following circumstances: The great size of the tumour, thrusting upward the bones of the shoulder; the distension of the surrounding parts; the great size of the veins, which covered and enveloped the artery; the large nerves of the axillary plexus, liable to be included in the ligature; and the danger of the introduction of air into the circulation. The pulsation in the tumour ceased as soon as the ligature was drawn, and the patient improved rapidly under the use of tonics. The sac gradually diminished, until the nineteenth day after the operation, when it became more painful, and the skin, or a portion of it, gave indications of sloughing. Dr. Armsby was again sent for, who opened the sac, and removed nearly a quart of coagulated blood and fibrinous matter.

The case has progressed favourably; the ligature came away on the twenty-ninth day, and the recovery has been rapid and complete, as far as the operation is concerned. There is a slight discharge of watery matter from the sac, which is gradually diminishing.—*Boston Med. and Surg. Journ.*, Feb. 4, 1864.

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*Ligature of the Common Iliac Artery.*—Prof. BRAINARD reports (*Chicago Medical Journal*, March, 1864) the following case in which he performed this operation: April 9th, 1863, called to visit Col. Scott, 19th Illinois Vols., who was wounded at the battle of Stone River. A musket-ball had passed from before backwards through the thigh, entering below the pelvis and at the outside of the femoral artery, grazing the inside of the femur, and coming out of the buttock.

At the time of the accident, there was hemorrhage, which was controlled, as was supposed, by pressure on the femoral artery. The compression was continued about three weeks, during which time no hemorrhage occurred. The wound suppurated and some small scales of bone came out at each orifice of the wound.

He was removed to his home in Chicago, and did well, although the wound remained open behind, until about the 5th of April, three weeks after the accident, when a small tumour formed in front, which was opened. A day or two after, a hemorrhage took place from both openings. It was on account of this that my advice was asked. On the night of the 9th, at 11 o'clock, a copious hemorrhage renewed, which was controlled in a measure, but continued at intervals during the night.

10*th*. Saw him at 10 o'clock, and applied the compressor over the femoral artery. This seemed to arrest the bleeding, but in about two hours it returned.

The bleeding had been so great as to threaten death, and I determined to tie the external iliac artery, not doubting from the history of the case that the hemorrhage was from branches of the profunda femoris close to its origin.

With the aid of Prof. Freer and the Drs. Hurlburt, the ligature was placed upon the external iliac artery in the usual manner, as that described by Lisfranc; but on changing the position of the patient to remove the soiled bedclothing, the bleeding renewed as freely as ever. On a re-examination, the ligature was found to control the external iliac, and it was evident that the ischiatic artery was the one giving blood. The danger was urgent, and I enlarged the wound upward and outward, and placed a ligature on the common iliac artery. The anterior wound in the thigh was then enlarged, and a great quantity of coagula removed from it by the finger. No bleeding; patient under chloroform during the operation. Warm applications to the member; brandy and broth ordered.

11*th*, A. M. Limb cool, but not cold; has been troubled with nausea and attempts to vomit, which gave pain in the wound; pulse 100, condition good. Ordered an enema and a solution of soda bicarb. with gum Arabic for the vomiting. Broth continued.

12*th*. Has considerable pain and tenderness in the region of the left kidney. Pulse 120; slept well during the night, with two doses of acetum opii; wounds commencing to suppurate.

13*th*. Pulse 100; tenderness in left side diminished; takes broth with wine; slept well.

20*th*. Cut of operation suppurates freely. Allowed beef broth and wine, with opiate at night.

24*th*. Ligature on the external iliac artery came away.

*May* 1. Ligature on common iliac came away. Patient doing well.

12*th*. Wound from operation healed.

From this time, he remained in good health until the early part of July, although the wound continued to suppurate and some small pieces of bone were discharged at the posterior orifice.

At this time he was attacked by a copious watery diarrhœa followed by typhoid fever, of which he died July 8th, three months after the operation.

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*Divided Tendo-Achillis united by Silver Wire.*—Dr. G. L. SIMMONS, of Sacramento, relates (*Pacific Med. and Surg. Journ.*, Jan., 1864) a case in which the tendo-Achillis of a man was completely severed accidentally about an inch from its attachment. Dr. S. found the upper edge of the cut tendon retracted an inch and a quarter into its sheath. Dr. S. flexed the limb, drew down the retracted tendon by strong forceps, and united the cut ends with a large sized silver ligature; the leg was kept flexed for a few days with adhesive straps, after which the usual slipper and dog-collar were used. In a few weeks the patient was able to walk in a high-heeled shoe with but little pain. Scarcely any stiffness resulted from the injury, and at the date of the report he could walk freely with the slightest perceptible halt. The "propriety of using silver wire in uniting tendons," Dr. S. says, "can hardly be questioned. In the above case the result was all that could be desired; and, although position alone might possibly have accomplished the same end in the same time, yet it is probable that the perfect approximation of the parts by the ligature assisted in defining the bond of union until it became strong. In this case after the uniting mass was perfected, I removed the silver wire, as the play of the tendon caused the foreign body to slightly irritate the neighbouring tissues.

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*Hospital Gangrene.*—Dr. FRANK H. HAMILTON, Jr., Ass. Surg. U. S. A., has given (*American Medical Times*, Oct. 31, 1863) a tabular statement of 33 cases of hospital gangrene which occurred in the McDougal General Hospital. It appears from this table that but two of the cases terminated fatally, and these some days after the gangrene had been arrested. In one of these the patient died from exhaustion, the result of extensive suppuration in the knee-joint, the wound having been in a perfectly healthy condition for several days. In the other the patient died from dysentery, his wound having put on a healthy action two weeks before his disease.

In one case where nitric acid was used, the disease was not arrested, and at the end of ten days it was found necessary to amputate the leg above the knee.

The stump healed by the first intention. An analysis of the table shows that the average duration of all cases, under all treatments, amounts to 12.15 days.

| | |
|---|---|
| Number treated with nitric acid . . . . . | 18 |
| Average duration of disease . . . . . | 16 days |
| Number treated with sol. bromine . . . . | 14 |
| Average duration . . . . . | 6.6428 days |
| Number treated with iodine . . . . . | 1 |
| Average duration . . . . . | 7 days |

These results are decidedly favourable to bromine.

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*Traumatic Tetanus successfully treated with Chloroform and Subsequent Use of Belladonna.*—Dr. L. C. Lane reports (*San Francisco Medical Press*, Oct., 1863) the following case: Some weeks since, in the St. Mary's Hospital in this city, there was admitted a young man with fracture of the os femoris in its upper third; the fracture, which was comminuted in character, was the result of a fall from one of the city cars, while in motion.

The injury was treated by the application of Desault's long-extending and counter-extending splint. Shortly after the limb was dressed in this manner, tetanic symptoms presented themselves in the form of trismus, which ultimately became general, the whole body being thrown into violent muscular contractions. Soon after the supervention of these symptoms, the patient was put under the influence of chloroform by inhalation. He was maintained in a state of constant anæsthesia for near seven hours, consuming, in the meantime, several ounces of chloroform, administered by means of an inhaler, so constructed, that but a small amount of the article could escape without being breathed. After the use of chloroform for that length of time, the tetanic symptoms so far disappeared, that the inhalation was suspended, and the patient was ordered belladonna; opiates were also given him. On the following day, trismus again ensued, when resort was had again to the chloroform. The closure of the lower jaws was quickly relieved, whereupon the inhalation was discontinued.

The remedy to which I am inclined to refer the rescue of the man's life in this case, was chloroform. The inhalation, as will be perceived, was carried to a much greater extent than usual, or than prudence would dictate in any other than a hopeless case. After the discontinuance of the anæsthetic, the patient presented symptoms of aberration of mind, which were present for several days afterwards, though they gradually became less, and in a week afterwards, they disappeared. The patient is yet under my charge, in every respect doing well, though time enough has not yet elapsed to have effected entire union of his fractured femur.

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*Circumscribed Tumour of the Umbilicus, closely simulating Umbilical Hernia, apparently undescribed by authorities upon the subject, and perhaps new to Abdominal Diagnosis.*—Dr. H. R. Storer records (*Boston Med. and Surg. Journ.*, Feb. 25, 1864) the following interesting case: "Bridget McN., aged 40, was sent to the Woman's Hospital in the middle of November last by Dr. B. S. Shaw. She had been a patient at the Mass. Gen. Hospital, and her disease had there been very correctly suspected to be of malignant character. I will not enter into all the details of the case, although these in several respects are extremely interesting, inasmuch as they do not bear upon the special point for which I report the case. From the records of the Mass. Gen. Hospital, a full copy of which has been kindly sent to me by Dr. Shaw, it appears that the patient entered that institution on Aug. 14th, with ascites. She was tapped on the 30th of that month, eleven quarts of reddish, rather turbid serum being drawn off. No hepatic tumour was at that time to be discovered.

Shortly after her entrance at Pleasant St., I had occasion to again perform paracentesis, and it was repeated at intervals of a fortnight, some five or six times, until her death, which occurred on the 15th of the present month—upon each occasion two water-pails of bloody serum being removed, and upon each a tumour becoming more and more distinct a little to the right of the epigastrium, until it finally attained a size somewhat larger than a goose's egg. At the autopsy this proved to be the liver, enlarged and with extensive depositions of encephaloid matter, pronounced by Dr. Ellis of cancerous character. The

omentum, peritoneal surface and tract of the intestines were studded with carcinomatous deposits, and the uterus and ovaries, though never having given signs of functional or other disturbance, were degenerated into a common mass of disease, their relative limits being almost undistinguishable.

At the umbilicus there had always been noticed, since my first observation of the case, a circumscribed tumour of about the height and size of the last phalanx of the thumb, so entirely suggestive of an ordinary umbilical hernia that the possibility of its being otherwise was never suggested or entertained. The tumour remained of the same character at all times—both before and after tapping when the abdomen was distended and when it was empty—and was therefore supposed to be occasioned by old adhesions of some portion of the bowel, with perhaps partial strangulation, dating possibly from childhood; and therefore the absence of acute symptoms, hardly to be expected under such circumstances, was not considered unusual.

At the *post-mortem* examination, however, it proved that there was no loop of intestines in the neighbourhood of the umbilicus—that there was not and never had been any hernia at all. The tumour was well defined, localized, and entirely circumscribed. Upon incision by Dr. Ellis, it proved to be merely a deposition of softened carcinomatous matter in the substance of the umbilical tissue.

One case alone, at all approximating to this in character, had come to the knowledge of Ballard, that close student of the diseases of the abdomen. In the instance referred to, "the parietal peritoneum being infiltrated with colloid, the umbilicus presented a stretched and flattened appearance,"[1] an appearance entirely different from that now reported, and giving rise to no such mistaken opinion. Its occurrence as an element towards clearing up one at least of the very many possible obscurities of abdominal diagnosis, has seemed to me of sufficient importance to deserve being permanently recorded.

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*Needles in the Body.*—To the many very curious cases of this kind recorded, Dr. F. D. LENTE, of Cold Spring, adds (*American Med. Times*, Dec. 26th, 1863) the following: He states that he was called to a girl, about seven years of age, who had told her mother five months previously that she had swallowed a pin. As no unpleasant symptoms supervened, the occurrence was soon forgotten. until a few days before Dr. Lente was called in, when she complained that on stooping down something pricked her in the belly; and upon feeling with her fingers she discovered what she supposed to be the fogotten pin; upon examining the spot, which was a few inches below the umbilicus, after some manipulation I managed to get the two ends of the substance between two fingers, and, on pressing one end outwards forcibly, the point of what proved to be a needle an inch and a half in length projected through the skin, and was drawn out by a pair of forceps. It was blackened and very brittle. No unpleasant consequences have resulted. Dr. Lente also states that he knew an old gentleman, who was engaged in a large mercantile business, who suffered for twenty or thirty years with "neuralgic pains," so they were called, in different parts of the body, for which but little relief was obtained, and from which his constitution suffered very much. One day, while writing in a private room of his establishment, and rubbing his knee, which was, at the time, the seat of one of his neuralgic attacks, suddenly, to his great surprise, the point of a needle popped out of the skin. Before endeavouring to pull it out, he called in some of his clerks to witness the phenomenon. He never afterwards suffered from any of his former attacks.

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*American Medical Association.*—The 15th Annual Meeting of the "American Medical Association," will be held in the city of New York; commencing, Tuesday June 7th, 1864, at 10 o'clock A.M.

Proprietors of Medical Journals throughout the United States and the Territories are respectfully requested to insert the above notice in their issue.

GUIDO FURMAN, M.D., *Secretary.*

NEW YORK, March, 1864.

[1] Diseases of the Abdomen, p. 144.

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## GRADUATES OF JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA, MARCH, 1863.

At a Public Commencement, held on the 10th of March, 1864, the degree of DOCTOR OF MEDICINE was conferred on the following gentlemen by the Hon. EDWARD KING, LL. D., President of the Institution; after which an Exhortation to the Graduates was delivered by Prof. DUNGLISON.

| NAME. | STATE OR COUNTRY. | SUBJECT OF THESIS. |
|---|---|---|
| Andrews, T. Hollingsworth | Pennsylvania. | Erysipelas. |
| Ashton, Asa S. | Ohio. | Science and Practice of Medicine. |
| Barr, David Miller | Maryland. | Hemorrhagic Labours. |
| Bartles, William H. | New Jersey. | Habit and Diseases. |
| Bell, James (M.D.) | Ohio. | Diphtheritis. |
| Bell, Joseph G. | Maryland. | Pneumonia. |
| Bese, Frederick | Pennsylvania. | Cynanche Trachealis. |
| Blanton, Carter (M.D.) | Kentucky. | Diseases of the Teeth and their Sequelæ. |
| Boyer, Samuel S. | Pennsylvania. | Gonorrhœa. |
| Brown, William A. | Ohio. | Nervous Fluid and the Antidotes of Narcosis. |
| Brownfield, B. F. | Pennsylvania. | Primary Syphilis. |
| Buckner, Garrett Davis | Kentucky. | Gunshot Wounds. |
| Burden, Jesse R. | Pennsylvania. | Scrofula. |
| Butcher, Samuel | New Jersey. | Intermittent Fever. |
| Caldwell, Daniel G. | Pennsylvania. | Enteric Fever. |
| Caldwell, Wm. Spencer | Illinois. | Medical Sectarianism. |
| Campbell, William H. | Missouri. | Enteric Fever. |
| Cary, Ezra H. | Pennsylvania. | Enteric Fever. |
| Case, James B. | Pennsylvania. | Conception and Gestation. |
| Christie, William | New Brunswick. | Coxalgia. |
| Christopher, Howard L. | Kentucky. | Typhoid Fever. |
| Clinkinbeard, Allen K. | Kentucky. | Dysentery. |
| Clements, Christopher C. | Kentucky. | Ipecacuanha. |
| Davis, Harden A. | Indiana. | Iron and its Compounds. |
| Dean, John W. (M.D.) | Indiana. | Ulceration of the Os Uteri. |
| De Ford, Harry S. | Pennsylvania. | The Uterus. |
| Dodge, Wm. Campbell, Jr. | Vermont. | Diphtheria. |
| Dougherty, J. Drake | Kentucky. | Inflammation. |
| Dundor, Adam B. (M.D.) | Pennsylvania. | Dyspepsia. |
| Edwards, Thomas J. (M.D.) | California. | Intellection. |
| Engelman, David | Pennsylvania | Dysentery. |
| Ferguson, Lewis L. (M.D.) | Kentucky. | Spermatorrhœa. |
| Forsythe, Matthew Leander | Kentucky. | Pericarditis, Symptoms and Physical Signs. |
| Freas, William B. | Pennsylvania. | Scarlatina. |
| Fuller, Amos B. | Ohio. | Dysentery. |
| Geddes, Clarence | Pennsylvania. | Discovery of the Circulation. |
| Gemmill, Robert B. | Pennsylvania. | Variola. |
| Gibson, Lycurgus | Pennsylvania. | Inflammation. |
| Gibbs, Henry L. | Pennsylvania. | Diagnosis. |
| Gillespie, Robert | Pennsylvania. | Typhoid Fever. |
| Gray, John W. | Indiana. | Erysipelas of the Fauces. |
| Grimes, Louis A. | Ohio. | Stricture of the Urethra. |
| Gumbes, Charles W. | Pennsylvania. | Trifolium in Fœno. |
| Hill, Walter B. | Kentucky. | Opium. |
| Hittle, Benjamin F. | Pennsylvania. | Diphtheria. |
| Hogendobler, Israel | Pennsylvania. | Signs of Pregnancy. |
| Howes, Daniel L. | Canada West. | Measles. |
| Jack, William | Pennsylvania. | Respiration. |
| Jackson, John | Pennsylvania. | Acute Rheumatism. |
| Jones, James | Maryland. | Pneumonia. |
| Jordy, George H. | Pennsylvania. | Hygea. |
| Keeley, Jerome | Pennsylvania. | Typhoid Fever. |
| Krecker, Frederick | Pennsylvania. | Diphtheria. |
| Lapsley, John B. | Kentucky. | Physical Signs and Diagnosis of Pneumonitis. |

| NAME. | STATE OR COUNTRY. | SUBJECT OF THESIS. |
|---|---|---|
| Leaman, Brainerd | Pennsylvania. | Enteric Fever. |
| Leaman, Henry | Pennsylvania. | Conservatism in Medicine. |
| Leighton, Walter H. | Massachusetts. | Intermittent Fever. |
| Lineaweaver, Simeon T. | Pennsylvania. | Bromine in Hospital Gangrene and Phlegmonous Erysipelas. |
| Lippincott, Franklin B. | New Jersey. | Hospital Gangrene. |
| Lippincott, Henry | Nova Scotia. | Rheumatism. |
| Lowndes, Charles T. | W. Virginia. | Pneumonia. |
| Martin, Edwin | Pennsylvania | Gunshot Wounds. |
| Massey, Isaac | Pennsylvania. | Icterus. |
| Maupin, William T. | Missouri. | Alcohol. |
| Maxwell, J. Gordon, Jr. | Pennsylvania. | Clinical Surgery. |
| McArthur, John A. | Pennsylvania. | Compound Fractures of the Thigh. |
| McClure, William Wallace | Pennsylvania. | Cinchona. |
| McCormick, J. F. | Pennsylvania | Tinctura Ferri Chloridi. |
| McCoy, Henry W. | Illinois. | Emetics. |
| McIntyre, John H. | Indiana. | Scurvy. |
| McKenzie, George I. | Nova Scotia. | Acute Pneumonia. |
| McLaughlin, James A. | Massachusetts. | Typhoid Fever. |
| Miller, David P. | Pennsylvania. | Intermittent Fever. |
| Miller, Lloyd T. (M.D.) | Missouri. | Santonin. |
| Miller, Robert | Kentucky. | Dislocation of the Femur. |
| Millikan, Robert H. | Ohio. | Syphilides. |
| Mullen, Henry | Pennsylvania. | Scarlatina. |
| Nelson, George W. (M.D.) | Missouri. | Treatment of Diphtheria. |
| Newcomer, Joseph W. | Pennsylvania. | Aneurism. |
| Parker, William S. | Ohio. | Phthisis Pulmonalis. |
| Pennsyl, Philip H. | Pennsylvania. | Phthisis Pulmonalis. |
| Pitcher, Stewart C. | Indiana. | Hospital Gangrene. |
| Phillips, Edwin | Illinois. | Intermittent Fever. |
| Phillips, Thomas H. | Pennsylvania. | Acute Dysentery. |
| Price, William H. | Indiana. | Sulphate of Quinia. |
| Pritchett, James W. | Kentucky. | Inflammation of the Cervix Uteri. |
| Raudenbush, Abraham S. | Pennsylvania. | Diospyros Virginiana. |
| Reed, T. J. | Canada West. | Typhoid Fever. |
| Richardson, Newton M. | Pennsylvania. | Pathology of Asthma. |
| Richardson, William | Canada West | Intermittent Fever. |
| Ridgway, Thomas Edwin | Pennsylvania. | Chronic Gastritis. |
| Seagrave, Joseph S. | New Jersey. | Chemistry applied to Medicine. |
| Senseman, John | Ohio. | Enteric Fever. |
| Sharples, Abram | Pennsylvania. | Two Medical Cases. |
| Shew, Abraham Marvin | New York. | Mental Derangement. |
| Simon, William I. | Pennsylvania. | Aneurism. |
| Smith, Henry A. M. | Pennsylvania. | Scarlatina. |
| Smith, Jacob Jontz | Indiana. | Parental Influence on the Embryo. |
| Smith, John R. | Illinois. | Retention of Urine. |
| Steckel, Alfred P. | Pennsylvania. | Pleurisy. |
| Stewart, Joseph F. | Pennsylvania. | Infantile Remittent Fever. |
| Stockton, James Clark | Pennsylvania. | The Uterus and its Functions. |
| Stokes, J. Spencer | New Jersey. | Acute Rheumatism. |
| Sudler, William T. | Delaware. | Intermittent Fever. |
| Taylor, Robert W. | Kentucky. | Epidemic Erysipelas. |
| Thompson, James F. | Pennsylvania. | Physiology of Digestion. |
| Thomson, A. Agnew | Pennsylvania. | Rest and its Therapeutical Influence. |
| Thomson, Benjamin F. | Kentucky. | Pneumonia. |
| Tucker, James E. | Kentucky. | The Medical Student. |
| Underwood, Warren J. | Pennsylvania. | Circulation of the Blood. |
| Van Kirk, Theophilus R. | Pennsylvania. | Diphtheria. |
| Vannuys, D. H. | Indiana. | Pseudo-membranous Laryngitis. |
| Verner, Chittick | Pennsylvania. | Diabetes. |
| Wallace, James P. | Indiana. | Immediate and Remote Effects of Injuries of the Brain. |
| Weaver, Charles H. | New York. | Pyæmia. |

| NAME. | STATE OR COUNTRY. | SUBJECT OF THESIS. |
|---|---|---|
| Webster, John R. (M.D.) | Illinois. | Pneumonia. |
| West, Theodore S. | Virginia. | The Typhus Group of Fevers. |
| White, Elisha M. | Massachusetts. | Diarrhœa in the Army. |
| Wiley, Charles | New Jersey. | Diphtheria. |
| Willis, Samuel W. | Kentucky. | Cholera Maligna. |
| Witman, Harrison T. | Pennsylvania. | Veratrum Viride. |
| Woods, William S. | Missouri. | Inflammation. |
| Woodward, Charles E. | New Jersey. | Sarracenia Purpurea. |
| Worthington, William E. | Missouri. | Intermittent Fever. |

Of the above, there are from—

| | | | |
|---|---|---|---|
| Pennsylvania | 54 | Canada West | 3 |
| Kentucky | 16 | New York | 2 |
| Indiana | 9 | Nova Scotia | 2 |
| Ohio | 8 | Vermont | 1 |
| New Jersey | 7 | Delaware | 1 |
| Missouri | 6 | California | 1 |
| Illinois | 5 | Western Virginia | 1 |
| Maryland | 3 | Virginia | 1 |
| Massachusetts | 3 | New Brunswick | 1 |
| | | | 124 |

## HARVARD UNIVERSITY.

### SUMMER SESSION OF THE MEDICAL DEPARTMENT.

The Annual Course of Summer Instruction in the Medical Department of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on Monday, March 14, 1864, and continue till November.

Clinical, Medical and Surgical Instruction will be given at the Massachusetts General Hospital, adjoining the College.

Recitations from approved text-books will be held daily during the session at the College, upon all branches necessary to a medical education. Occasional lectures are also given, and demonstrations, illustrated by the Museums of the College.

During the Summer Session, instruction is given by lectures at Cambridge, on Botany, by Prof. Gray; on Comparative Anatomy, by Prof. Wyman; on Zoology, by Prof. Agassiz; on Acoustics and Optics, by Prof. Lovering. To these lectures, students of the Summer Session will be admitted without extra charge.

Good Board can be obtained at $3 50 or $5 00 per week.

Fees for the Summer Term (which must be paid in advance), $100, without extra charge for Matriculation, Hospital, Library or Dissections; for six months, $100; for three months, $50.

D. Humphreys Storer, M. D., Professor of Obstetrics and Medical Jurisprudence.
John B. S. Jackson, M. D., Professor of Morbid Anatomy.
Henry I. Bowditch, M. D., Professor of Clinical Medicine.
Oliver W. Holmes, M. D., Professor of Anatomy and Physiology.
George C. Shattuck, M. D., Hersey Professor of the Theory and Practice of Medicine.
Henry J. Bigelow, M. D., Professor of Surgery and Clinical Surgery.
John Bacon, M. D., Professor of Chemistry.
Edward H. Clarke, M. D., Professor of Materia Medica.
David W. Cheever, M. D., Demonstrator.
Wm. E. Coale, M. D., Assistant in Theory and Practice.
Francis Minot, M. D., Assistant in Theory and Practice.
Richard M. Hodges, M. D., Assistant in Surgery.
Calvin Ellis, M. D., Assistant in Morbid Anatomy.
J. Nelson Borland, M. D., Assistant in Clinical Medicine.
James C. White, M. D., Assistant in Chemistry.
Fitch E. Oliver, M. D., Assistant in Materia Medica.
Horatio R. Storer, M D., Assistant in Obstetrics.

Tickets to the Session must be procured before students will be admitted to the Course.

D. HUMPHREYS STORER, Dean of the Faculty,
*No.* 132 *Tremont Street, Boston.*

Circulars can be obtained gratis, upon application to David Clapp, Medical and Surgical Journal Office, over 334 Washington Street, Boston. Jan. 1st, 1864.